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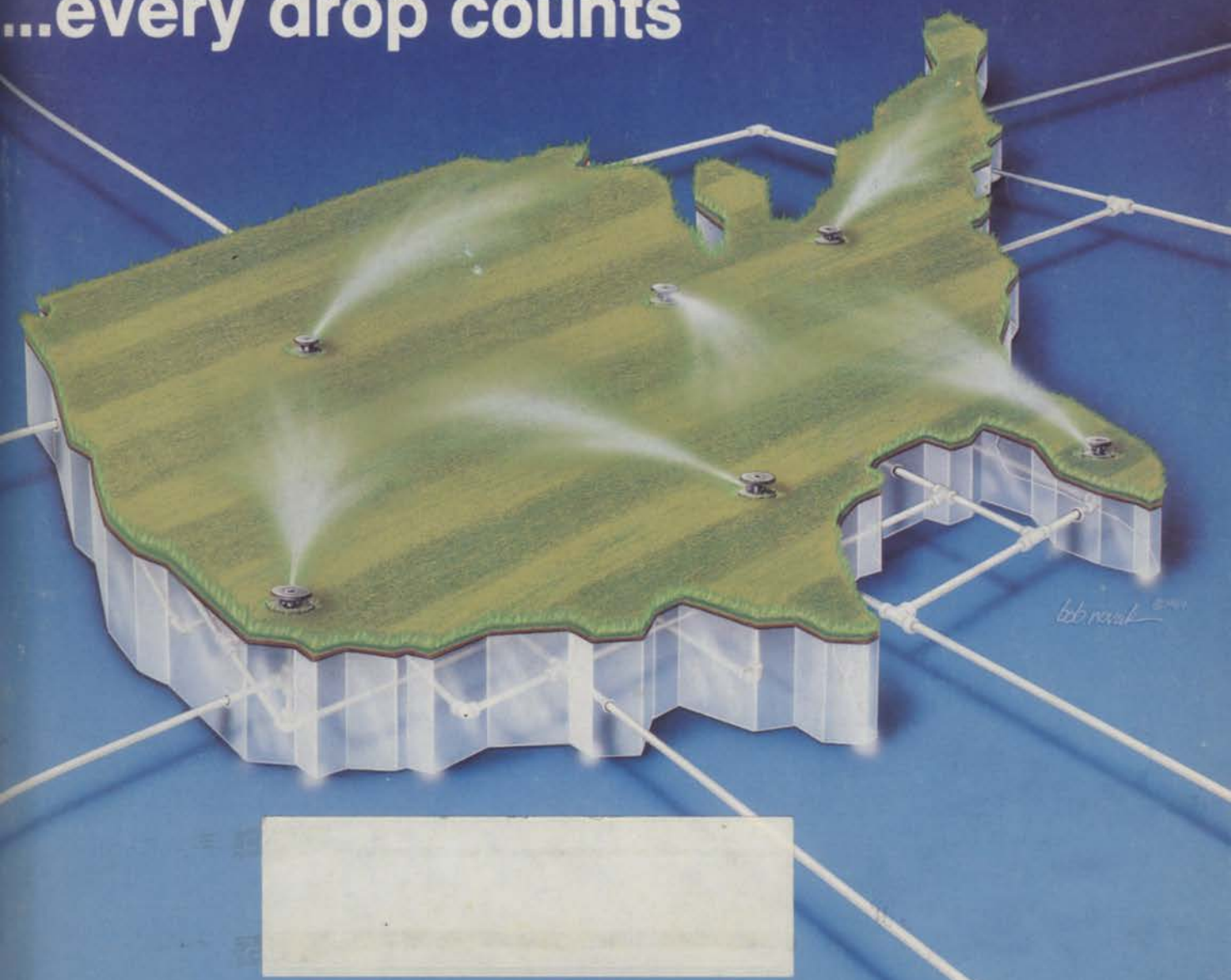

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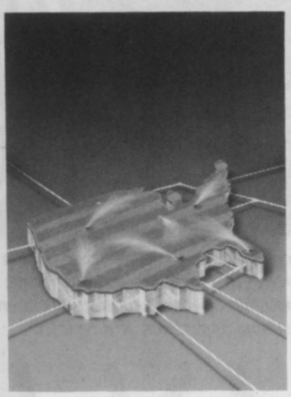
MAY 1989, VOLUME 29, NUMBER 5

LANDSCAPE MANAGEMENT



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Dollar Spot first appears as yellow-green blotches on grass blades. Overall view of affected area shows patches from a few inches to several feet in diameter. Treat preventively at a rate of 1 oz./1,000 sq.ft. every 28 days.

Summer Patch first appears as small patches of light green turf but can fade within hours to a light straw color. Research indicates best results are obtained with a preventive application of 4 oz. when soil temperature reaches 60-70°, followed by a second application 30 days later.

Red Thread, in its latter stages, is distinguished by the presence of bright coral pink thread-like structures 1/16-1/4 inch in length. Use Banner preventively, before disease problems begin, with 2 oz. every 14-21 days.

Anthracnose is most severe on Poa annua and first appears as irregular patches of yellowing turf which eventually turn bronze before fading to light tan. Prevent damage with 1-2 oz. of Banner every 14-28 days.

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Powdery Mildew gets its name from the early stage growth of a gray-white powdery fungus on the leaf surface. In cases of high incidence, entire turf areas may appear dull white. Prevent fungus growth with 1-2 oz. every 14-28 days.

Rust shows up first as light yellow flecks on the grass leaves. If left untreated, leaf surface will eventually rupture and yellow-orange or reddish-brown pustules develop. Preventive treatment calls for 1-2 oz. every 14-28 days.

Spring Dead Spot appears as circular, straw-colored patches on Bermudagrass leaves just as they begin to green-up in spring. The rest of the plant is affected with black to brown dry rot. University research indicates preventive control can be obtained with 4 oz. applied in the fall.*

Brown Patch is recognized by a "frog-eye" pattern formed by the diseased turf encircling green, unaffected plants. For prevention, apply 2-4 oz. every 10-21 days. If disease is already present, apply 2 oz. with a registered contact fungicide.

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AS I SEE IT...

Return of the drought?

Recent news item: "*Combined storage levels in the three New York City reservoirs are at 48 percent of capacity. Normal storage at this date would be 83 percent. River flow at Trenton was only 25 percent of normal volume. The deficit rainfall for North Jersey is 11 inches. The deficit for South Jersey is 9 inches.*"

This is not good news, folks.

There *will* be a watering ban for most of metropolitan New York City, says Brooklyn extension agent John Amoroso. "I doubt if it'll be lifted until next winter," he says. "We've had a dry winter. Usually, we get a spring thaw and the snow comes down as water. But there's no snow up there."

Though the lawns are small in Brooklyn, the Queens and the Bronx, the cumulative effect of watering them would be felt.

"We recommend one inch of water every three days," Amoroso continues. "Do you know how much water that takes, even for a 10-by-10 lawn? A lot."

The only exception to the New York watering ban is for vegetable gardens, and homeowners must use a watering can; no hoses.

Up north in Nassau County, where extension agent Maria Cinque does business, they've worked an odd-even watering system the last two years, with no watering from 10 a.m. to 4 p.m. Nassau County, unlike New York City, draws its water from groundwater.

Cinque says that, last summer, it was common for neighbors to report people watering in pesticides on the wrong day to the police.

Some landscaping companies in the City have found a solution, Amoroso notes. "A lot of guys have wells and they carry their own water," he says.

Amoroso developed a list of recommendations he gives landscapers and homeowners. He wrote them in 1986 when the exact situation arose. Among the points: add organic matter to soil; use mulches; provide windbreaks; and plant drought-resistant annuals.

Bottom line: what do bans like this mean to companies applying pesticides?

"They obviously have to be more careful about scheduling days when they're putting down materials that have to be watered in," Cinque claims.

Jerry Roche

Jerry Roche, editor

LM

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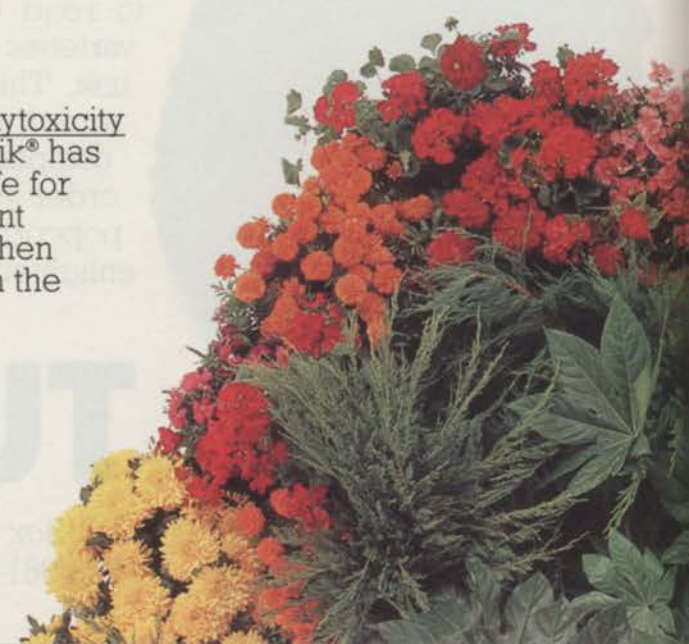

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GREEN INDUSTRY NEWS

MAY 1989, VOLUME 31, NUMBER 5

LANDSCAPE MANAGEMENT

ASSOCIATIONS

Green industry's shakers team up for new coalition

CHICAGO — To insure that their collective voice will be heard, nine green industry trade associations teamed up here Feb. 22-23. Ed Davis, president of the American Sod Producers Association (ASPA), served as acting chairman.

Task forces were established to determine the organizational framework and a potential name. Other interim projects approved were:

- evaluation of an industry-wide economic survey;
- developing an improved information exchange on legislative and regulatory matters;
- coordination of programs directed to environmental improvement and overall public perceptions and policies.

"This had been attempted a couple years ago, but very little was accomplished," notes Doug Fender, executive director of the ASPA. "Last time we all saw each other, five or six of us said, 'let's try it again but this time let's focus it.'

"The result was an extremely positive meeting. We all feel that a proper path to the future has been set."

The group also agreed to begin an inventory of existing educational programs and to exchange future meeting dates. To improve communications, the groups also agreed to extend special annual meeting invitations to the leaders of the other groups and consider providing complimentary exhibit booth spaces.

"Each of the nine organizations volunteered to take on some aspects of the future of this group," says Fender.

Other associations present: American Society of Landscape Architects, Associated Landscape Contractors of America, International Society of Arboriculture, Irrigation Association, National Arborist Association, Professional Grounds Management Society, Professional Lawn Care Association of America and The Lawn Institute. □

Green industry summit participants who met in Chicago recently: (Seated, from left) Ron Kujawa, ALCA; Robert Skiera, ISA; Bob Felix, NAA; Brian Kubota, ASLA; Russell Studebaker, PGMS; (Standing, from left) David Bohardt, ASLA; William Kruidenier, ISA; R.C. Sears, IA; Randy Tischer, ASPA; Jeff Bourne, PGMS; Terry Peters, ALCA; Jim Brooks, PLCAA; Bob Parmley, PLCAA; Ed Davis, ASPA; Doug Fender, ASPA; Dr. Eliot Roberts, LI; Dick Hunder, IA; and Frank Harder, NAA.

Next month:

- **Cool-season disease control by Dr. Bill Shane of Ohio State University**
- **Warm-season disease control by Dr. Don Blasingame of North Carolina**

RESEARCH

Ohio State profs observe drought

KENT, Ohio — "We are going to be selling fertilization as an aid to recover from the drought," says Richard Rathgens of Davey Tree Co. "Our clients are receptive."

Rathgens was addressing a group of green industry experts at a "drought seminar" held at Davey Tree here this spring.

Rathgens also noted that Davey Tree lost about $500,000 to the drought last year. "People cancelled fertilization, wanting to wait and see what happened," he noted. "Many of the lawns *did* recover. We did a lot of seeding last fall and many customers are requesting it this spring."

Because of the overly dry conditions, many diseases showed up in lawns, Dr. Chuck Powell of Ohio State University observed.

"We saw a lot of unusual turf diseases. I think it was because the grass was predisposed to diseases. Are they still pre-disposed this spring? It'll be interesting to see."

Powell noted that red thread "was showing up in 95°F weather" and that "fungus diseases went wild."

Panelists at Davey Tree discuss the drought (left to right): Drs. John Street, Bill Pound and Chuck Powell of Ohio State University; Richard Rathgens of Davey Tree; Dr. Elton Smith, also of OSU.

Dr. John Street of Ohio State also had some interesting observations.

"One thing we quickly realized," he said, "is that the public connotes brown with dead. But when city officials learned the term 'dormant,' they went too far the other way and used it as a panacea."

Street said that Kentucky bluegrass in unirrigated areas experienced a 20 to 30 percent death rate. Kentucky-31 tall fescue did not go dormant at all "and came back extremely well." Fine fescues experienced the greatest failure rate. "Lawns with more thatch were the ones that were extensively damaged," Street said.

The sessions were chaired by Jim Chatfield, county extension agent for Akron and vicinity. Also serving on the panel were Dr. Bill Pound and Dr. Elton Smith. □

SEED

Oregon groups promote burning

SILVERTON, Ore. — In one corner of the green industry is the fight over water regulations. In another brews the battle over field burning.

The Oregon Women for Agriculture issued thousands of brochures in March explaining the benefits of field burning in an attempt to snuff out efforts by some to ban the practice.

"Our organization exists for educational purposes," says Caroline Simmons. "We felt we had to make some noise."

The fervor of anti-burn activists was ignited by an August, 1988 traffic accident in which seven people were killed. Drifting smoke

continued on page 14

TURF

Drought tolerance reviewed

PLAINVIEW, N.Y. — To best prepare for drought conditions, why not install the best drought-tolerant grass? No reason not to, says Maria Cinque of the Cornell Cooperative Extension of Nassau County.

As strict water conservation becomes an industry standard, Cinque says it will be much easier to reduce lawn water by selecting varieties like:

Cinque

- Tall fescues, which are the most drought tolerant, according to Cinque. They also can grow on a wide range of soils with less than normal amounts of fertilizer.
- Fine fescues, which are drought and shade tolerant, and prefer not to be over-watered or over-fertilized. Cinque suggests using them in combination with Kentucky bluegrass or perennial ryegrass.
- Perennial ryegrasses, which are quick germinators, are wear tolerant and grow fairly well in light to moderate shade.
- New varieties of Kentucky bluegrass combine good looks with reduced maintenance.
- Zoysiagrass, which can provide a thick, cushiony turf. It withstands high temperatures, grows well on poorer soil and can be mowed closer than most northern cool-season grasses. □

GOLF

Prolific golf writer Herb Graffis passes away at 95

FT. MYERS BEACH, Fla. — Herb Graffis, one of the golf industry's staunchest supporters, passed away here February 12.

Graffis and his brother Joe, who died in 1979, co-founded *Golfdom* magazine in 1927. *Golfdom* magazine eventually became *Golf Business*, which was folded into the old *Weeds Trees & Turf*, in 1977. Two years ago, WT&T became *Landscape Management*.

The elder Graffis (he was 95 years old at the time of his death) was a prolific golf writer, helping organize the Golf Writers Association of America. In 1975, Graffis wrote "The PGA," the official history of the organization.

He also had a hand in helping organize what is now the National Golf Foundation.

Graffis was born in Indiana, but attended Northwestern University and spent much of his life in the Chicago area. □

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SHORT CUTS

TURFGRASS PLUGS...Milt Engelke, Ph.D. at Texas A&M University, recently got a chance to plug the turfgrass industry when he was interviewed by The Associated Press. Engelke told the AP that last summer's drought "was like a Sunday school picnic. It's going to get a lot worse." He also told the reporter that the Texas A&M lab keeps artificial turf around "to clean our shoes."

A COLORFUL ADDITION... Multi-colored cotton lint plants are available from the Southern Crops Laboratory in College Station, Texas. **A. Edward Percival**, geneticist, has cotton lint plants in green, many shades of brown, khaki and chocolate. **Shull Vance**, golf course superintendent at The Country Club of Mobile, has planted many varieties of the ornamental and brown lint cotton. Vance wrote to us to say he planted them "in containers for display, in a planter next to one of the club's swimming pools, and a few rows back of the No. 14 tee." To obtain the cotton seeds, write to the Crop Germplasm Research Unit, P.O. Drawer N, College Station, Texas 77841.

A WEALTH OF TREES... Ever consider how much value a tree adds to the landscape? The United States Forest Service has the answer. According to the USFA, trees can contribute an average of seven percent to the value of a half-acre home site and as much as 27 percent of the appraised value of the property.

NEW ENTERPRISE...Robert Scobee, former market development and sales manager for The Andersons' Lawn Products Division, has formed New Trends Marketing, a product sales/development venture to assist turf care product manufacturers penetrate lawn and garden markets. For more information, call Scobee at (419) 874-4019 in Perrysburg, Ohio.

R_x FOR A LEGEND... The "Lover's Oak" in Brunswick, Ga. is 900 years old, according to legend. When members of the American Society of Consulting Arborists visited it, they determined that a general lack of maintenance had resulted in serious decay and hazardous liability potential. ASCA executive direct **Jack Siebenthaler**, one of the visitors, offered the organization's assistance at no charge to the city. They will recommend possible courses of action for providing a longer and more useful life for the tree so that future generations can enjoy it in complete safety. Using the latest scientific methods, they also hope to determine the tree's actual age.

BURNING *from page 11*

across Oregon's Interstate 5 obscured drivers' vision, resulting in a multi-vehicle pile-up.

Seed producers are allowed to burn 200,000 acres this season—on days when conditions are right—an amount Clarence Simmons is happy with, but neither he nor other producers look forward to an outright ban. "Our fescues have to be burned, there's just no way out," insists Simmons, who operates Clarence Simmons Farms, Inc.

Two bills are under consideration by the Oregon legislature. A bill sponsored by Ron Cease seeks a three-year phase-down of burning. Sen. Grattan Kearns's bill would require an immediate ban.

The Oregon Seed Council says a three-year phase-down does not give producers enough time to determine the yields produced by alternatives to burning. □

LAWN CARE

ChemLawn after biopesticides

COLUMBUS, OH — ChemLawn Services Corp. is looking toward Ecogen, a small Pennsylvania company for strains of insecticidal bacteria from which it will develop biopesticides, a cheaper, more effective method of pest control in lawns and ornamental plants.

Under the agreement, ChemLawn will formulate the product from the strains and perform field trials. Exactly what pests will be targeted or when the product is to be released has not yet been determined, according to ChemLawn spokesperson Deb Strohmeyer.

Ecogen has as many as 7,000 strains of bacteria, called Bt, for Bacillus thuringiensis. These bacterial proteins kill insects upon ingestion.

There are a few Bt-based products for homeowners already on the market.

According to a *Wall Street Journal* report, the increased sensitivity of homeowners to chemicals has led ChemLawn to look for alternatives to battling pests traditionally controlled with chemicals. □

INSECTS

New product fights deer tick

BOSTON — EcoHealth, Inc. says its new product, Damminix, has proven to be more than 97 percent effective in reducing the number of Lyme disease-infected deer ticks on treated property. The product could be a major weapon in the battle against Lyme disease, which is carried by the deer tick.

According to EcoHealth, the findings were based on tests conducted in 1988 by the Connecticut Parks Department, the Nature Conservancy on Shelter Island, the Trustees of Reservation in Ipswich, Mass., and the New York State departments of Health and Parks and Recreation.

"These tests show that Damminix can play a major role in controlling this serious public health problem," says Alexander Kovel, president of Boston-based EcoHealth.

Developed by three scientists from Harvard's School of Public Health, Damminix works by focussing on the tick, *Ixodes dammini*, which carries the disease. Although adult ticks feed on deer, the immature ticks feed on the white-footed mouse, which carries the disease.

Damminix consists of biodegradable cardboard tubes filled with cotton balls soaked in permethrin, a mild insecticide. The tubes are placed in a grid pattern in the affected area in the spring and late summer. Mice then gather the cotton balls and bring them back to their nests where the treated cotton kills the ticks without harming the mice.

Damminix is registered with the EPA and in 12

states where Lyme disease has been detected. □

ASSOCIATIONS

Cleaning up groundwater

CLEVELAND — "If we don't take an active role in finding answers to the groundwater questions, somebody is going to do it for us."

Those words, spoken by John Thorne of Dupont, signal the formation of the Alliance for a Clean Rural Environment (A.C.R.E.).

A.C.R.E. is an educational effort being undertaken by 20 primary producers of agricultural pesticides, including ones used on trees and turf. Those 20 companies produce 90 percent of the pesticides used in the United States.

The major objective of A.C.R.E., a non-profit organization, is to help protect ground and surface water quality. A.C.R.E. members will receive 12 fact sheets per year and a quarterly newsletter. The organization will promote a Speaker's Bureau and a Speaker's Bank. It will hold roundtables in Ohio, North Carolina, Minnesota, Iowa, Kansas and two more agriculturally-oriented states. It will provide print and broadcast "public service announcements" to members.

Most information will deal with good management practices when handling, applying, storing and disposing of crop protection chemicals.

In a visit to LANDSCAPE MANAGEMENT magazine, A.C.R.E. executive director Patrick Haggerty acknowledged the fact that the green industry is indeed an important member of the agricultural community because of its high visibility among urban and suburban homeowners.

Membership in A.C.R.E. is free of charge, as it is completely supported by the chemical companies. To become a member of A.C.R.E., call (800) 545-5410. □

TREES

Global Releaf will cool planet

COLLEGE STATION, Texas — Global Releaf, a national tree-planting campaign by the American Forestry Association (AFA), is aimed at reducing high temperatures associated with the "greenhouse effect." The program's goal is to get people to plant 100 million trees in communities by 1992.

"Present global temperatures are the highest since records have been kept," says Dr. Michael J. Walterscheidt, forestry specialist with the Texas Agricultural Extension Service. "Trees planted around homes and in communities would break up 'heat islands' by shading buildings and concrete."

Tropical zones are losing forests to agricultural conversion at an estimated rate of 28 million acres per year, and urban expansion replaces trees with acres of concrete every day. If present trends continue, scientists estimate the level of atmospheric carbon dioxide (which creates the "greenhouse effect") will double, raising U.S. temperatures 6 to 12°F in a few decades.

The 100 million new trees could offset America's carbon dioxide emissions by 18 million tons a year and at the same time save American consumers $4 billion annually in energy costs, according to AFA estimates.

"Three well-placed trees around a house can cut home air conditioning energy needs by 10 to 50 percent," Walterscheidt notes.

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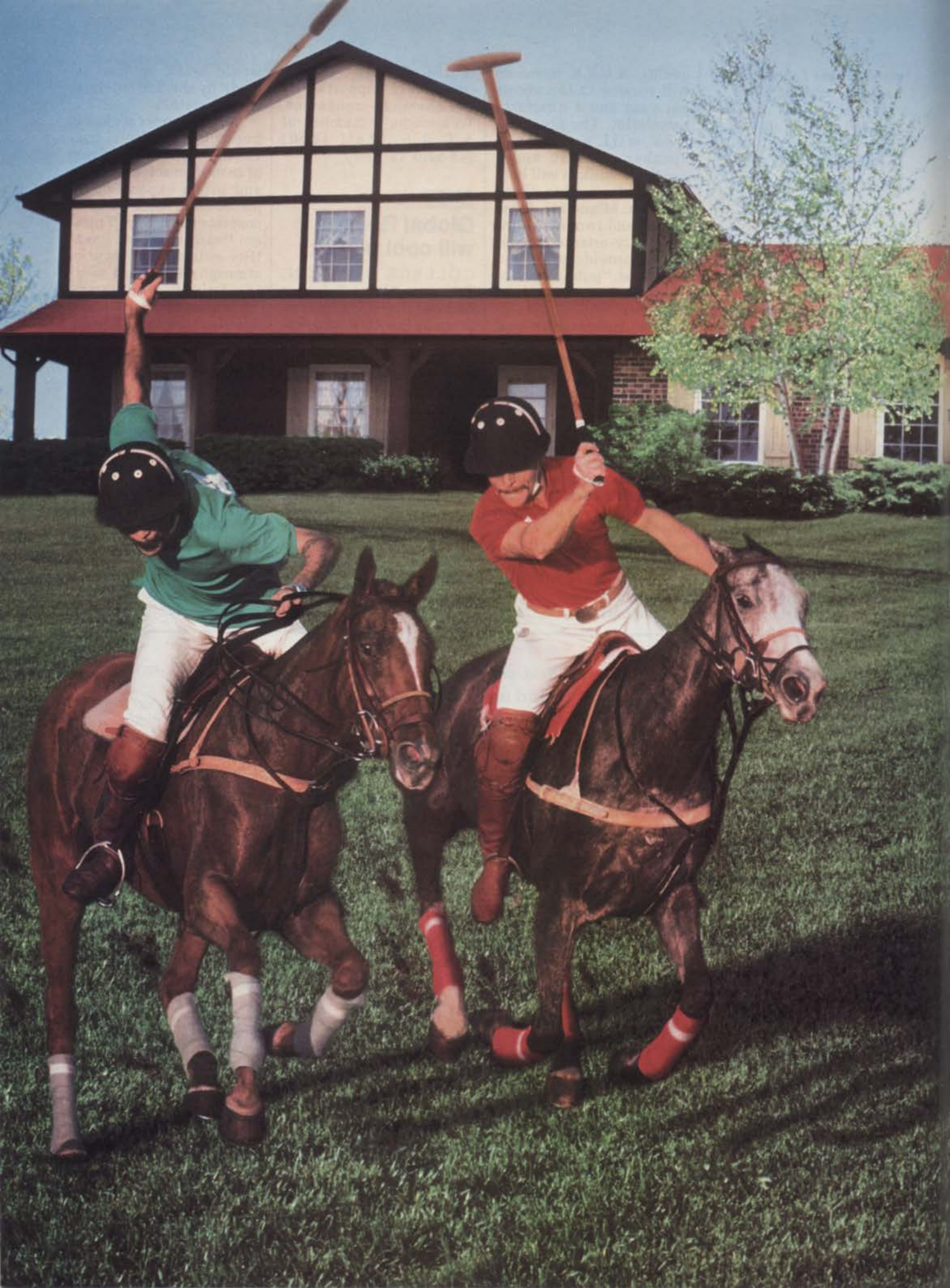
Don't forget the DURSBAN* or pests will have a picnic.



There's an easier way to stop surface feeding insects.

It's called DURSBAN* turf insecticide. Not as satisfying, perhaps, as batting the bugs with a polo mallet—but a whole lot more effective.

Broad-spectrum control that lasts. DURSBAN insecticide is the most efficient way to control surface-feeding turf insects. It's labeled for use against a broad spectrum of pests that attack turf, ornamentals and shade trees. And its residual power keeps them under control for weeks. No wonder it's the favorite of leading LCOs across the country.

Part of the "hit list." DURSBAN is particularly effective against billbugs, chinchbugs, sod webworms, cutworms and armyworms, among others. And because it bonds tightly to turf as soon as it dries, DURSBAN stays where it's applied. Won't wash away with rain or sprinkling.

Packaging options. DURSBAN turf insecticide is available as an emulsifiable concentrate in 2.5 gal. plastic jugs and 55 gal. drums. If you prefer a wettable powder, you can get the same efficacy in DURSBAN 50W, now offered in water soluble packets, pre-measured for the simplest, quickest mixing ever.

Why horse around? Control surface feeding insects the easy, sure way. With DURSBAN turf insecticide. Talk to your distributor today.

Attention: Always read the label before use and carefully follow all label directions and precautions.

DURSBAN*
TURF INSECTICIDE

DOW
*Trademark of
The Dow Chemical Company

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forests could offset up to one-third of the current carbon dioxide produced by burning fossil fuel, he adds. □

MANAGEMENT

Water audits to boom in the 90s

LONG BEACH, Calif. — As water regulations tighten over the next decade, water auditing will become a major business opportunity for landscape contractors.

Walt Jackson, specification manager for Irritrol Company, says a one-day program is already in full swing in California to supply contractors with the necessary auditing skills. Contractors may then offer proposals to public or private agencies to improve irrigation systems performance. "In most cases," says Jackson, "you can improve water use by 30 to 40 percent."

Contractors should consider jumping on this bandwagon. Jackson believes the next couple of years will bring even stricter mandates limiting water use, and, as he reluctantly admits, "you can't count on the homeowner to monitor and use equipment correctly."

Prerequisite skills for entering water auditing include experience in writing proposals or bidding, project planning and management and basic computer knowledge.

The one-day course costs $50. For more information, contact Marsha Prillwitz at the California Department of Water Resources, 1416 9th St., P.O. Box 942836, Sacramento, Calif. 94236-0001. □

Correction

There was an error in the "Herbicide Combinations" chart on page 50 of the March issue.

The chart listed "Rout" as being a combination of bromacil plus diuron, which is incorrect. That herbicide has been out of production for several years. It is no longer marketed by Hopkins Chemical.

A new "Rout" is now marketed by Sierra Chemical. It is a combination of Goal and Surflan herbicides that is used on ornamentals only. It is specifically labelled "not for use on turf." □

GOLF

Chemical woes are on the rise

Eighty-three percent of the people surveyed at the annual meeting of the Golf Course Superintendents Association of America (GCSAA) believe that chemical application regulations in their states are becoming more restrictive.

The poll, sponsored by Sandoz Crop Protection Corp., also revealed that 39 percent of superintendents have heard golfers express "very little or no concern" about the chemicals they apply, while 45 percent have heard "moderate concern."

When asked if they had changed their chemical application policies or procedures to enhance safety, many superintendents indicated that they had taken several courses of action: keeping better records (69 percent), selecting chemicals with reduced toxicity (49 percent) and changing maintenance practices (25 percent).

Association members from 31 states, most of whom were from California (15 percent) were surveyed. □

TURFSEED

Field days make June busy month

SEED COUNTRY — Those landscape managers interested in seed growing and harvesting will be able to gather a wealth of informa-

MITE.

tion at five seed company field days next month.

The parade of events begins June 12 when Jacklin Seed will host its Third Annual Turfgrass Discovery Tour. On display at the Post Falls, Ida. facility will be new tall fescue, Kentucky bluegrass, perennial ryegrass, Bermudagrass and zoyiagrass cultivars. Jacklin will also offer an up-to-date report and preview of the latest seed priming process and a tour of its new 3,000-square foot greenhouse.

For more information on the event, which will last through June 14, contact Gayle Ward, Doyle Jacklin or Marilyn Deutsch at (800) 635-8726 or (208) 773-7581.

Pure Seed Testing and Turf-Seed companies will have their Seventh Annual Turf Field Day at their research farm near Hubbard, Ore. on June 15. The event, which begins at 1 p.m., will feature tractor-drawn tours of the research plots and an Oregon-style barbeque.

For more information, call (800) 247-6910 or (503) 981-3017.

Pennington Seed will have the grand opening of its new Lebanon, Ore. facility on June 15, beginning at 9 a.m. Pennington has made arrangements to be on the Turf Seed agenda. For more information, call Ronnie Stapp at (404) 342-1234.

Lofts Seed will hold its field day June 21, 8:30 a.m. to 3 p.m., rain or shine. Last year, the company celebrated its 65th anniversary. For more information contact Karna Godridge: (201) 359-1100.

Turf Merchants will have its second annual field day on June 16. For more information, call Turf Merchants at (503) 926-8649. □

RESEARCH

Project to mark H_2O movement

SOCORRO, N.M. — A New Mexico Tech hydrology professor and a graduate student have teamed up on a project to determine if certain chemical compounds can be used as "tracers" to monitor groundwater movement.

Dr. Robert S. Bowman and Joseph Gibbens told the American Society of Agronomy that fluorinated benzoic acid compounds can now be used for soil and groundwater studies. They are environmentally safe and easy to detect at very low concentrations, they say, adding that some of them have already been used at the Waste Isolation Pilot Plant here and by the Illinois Geological Survey. □

GOLF

Architect calls for construction boom

PINEHURST, N.C. — Robert Trent Jones Jr., newly-elected president of the American Society of Golf Course Architects (ASGCA), has called for the construction of 5,000 new golf courses in the United States in the next 10 years.

Jones, architect of more than 150 golf courses all over the world, gave his rallying call recently, immediately after being elected president of the ASGCA at its annual meeting.

"The National Golf Foundation (NGF) says we must add at least one golf course every day for the next 10 years to meet the exploding demand for golf throughout the country," Jones said during his acceptance speech. "We should probably round that

Jones

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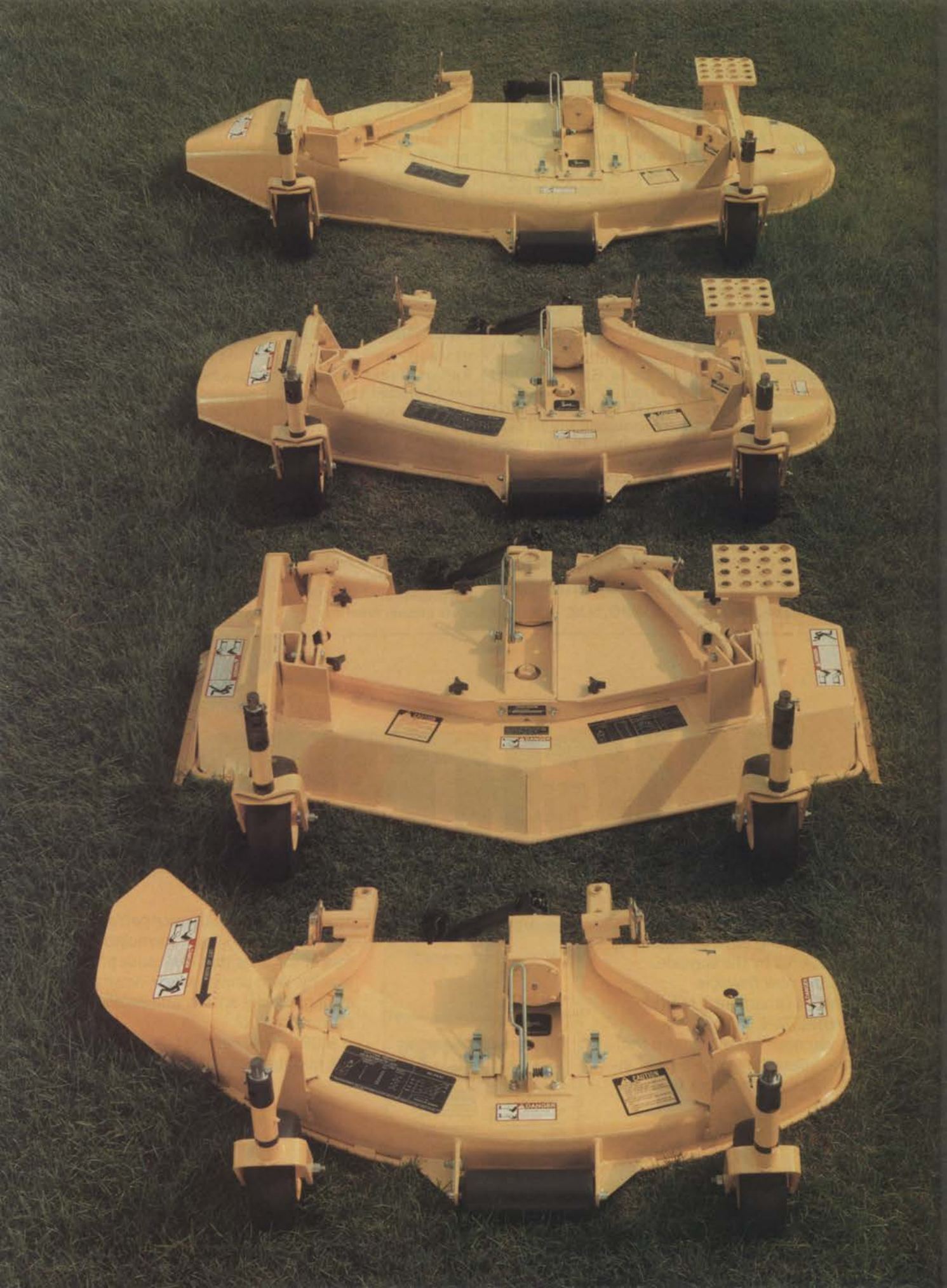

All our decks are stacked in your favor

It's tough to lose when you're dealt four aces. And that's what you automatically draw when you buy a John Deere front mower. Four mower decks whose superior strength, quality of cut and service access make you a sure winner every time.

Decks are formed from 9- and 10-gauge steel—the heaviest in the industry. Strong enough to stand up to the thousands of hours of tough commercial use you plan to give it.

Six John Deere Front Mowers from 17 to 28 hp give you a wide range of choices in both gas- and diesel-powered designs.

SUPERIOR STRENGTH

There's even a ¾-inch strip of steel around the bottom lip of each deck to protect it from those occasional unplanned meetings with curbs, trees, stakes and buildings. These decks don't wrinkle with age.

In addition, a PTO driveshaft, instead of belt drive, provides a more positive transfer of power from the traction unit to the mower deck gearbox. And, once that power makes it to the gearbox, spiral-cut drive gears ensure long life and quiet operation.

Pneumatic tires, simple height adjustment and a ¾-inch reinforcing bar all contribute to John Deere's exceptional front mower durability and performance.

Four solid choices help you choose the deck that's right for your traction unit and mowing conditions. The 50- and 60-inch side discharge decks fit the F910, F912 and F915. The 60- and 72-inch side discharge decks fit the F930, F932 and F935. The 60-inch rear discharge deck fits all six.

SUPERIOR CUT

A quality cut is also built into each of these decks. It starts with a deep contour design that improves airflow and clipping dispersal.

Dual lift cylinders allow each mower to hug ground contours closely. They oscillate up to 14 inches laterally and float up to 8 inches vertically. Enough movement to deliver fine-groomed cuts over severely undulating terrain.

Gauge wheels and anti-scalp rollers on the side discharge decks also help here. They serve as front and rear protection from sudden changes in ground contour. Plus, pneumatic front tires help soften the sting from unexpected bumps.

Cutting height adjustments are easily made without tools on all four decks. C-spacers let you quickly change your cutting height at ½-inch intervals between 1½ and 4½ inches on the side discharge decks—from 1 to 6 inches on the rear discharge model.

SUPERIOR SERVICE

The story gets better when it's time to change decks or add a different implement. One person can safely and easily change implements in a matter of minutes. Four pins and a quick coupler are all you need to deal with. No springs, no blocks, no hassle.

Service access is also a snap. Mower spindles are greased without removing belt shields. Belt shields are quickly removed without tools. And a service latch gives access for work under the deck and provides a safe method of removing mower blades.

John Deere front mower implements can be attached or removed by one person in minutes. Four pins attach the implement securely to dual lift cylinders.

All told, it's an unbeatable story. Talk to your John Deere dealer today for more information on these exceptional mowers. Or write John Deere, Dept. 956, Moline, IL 61265.

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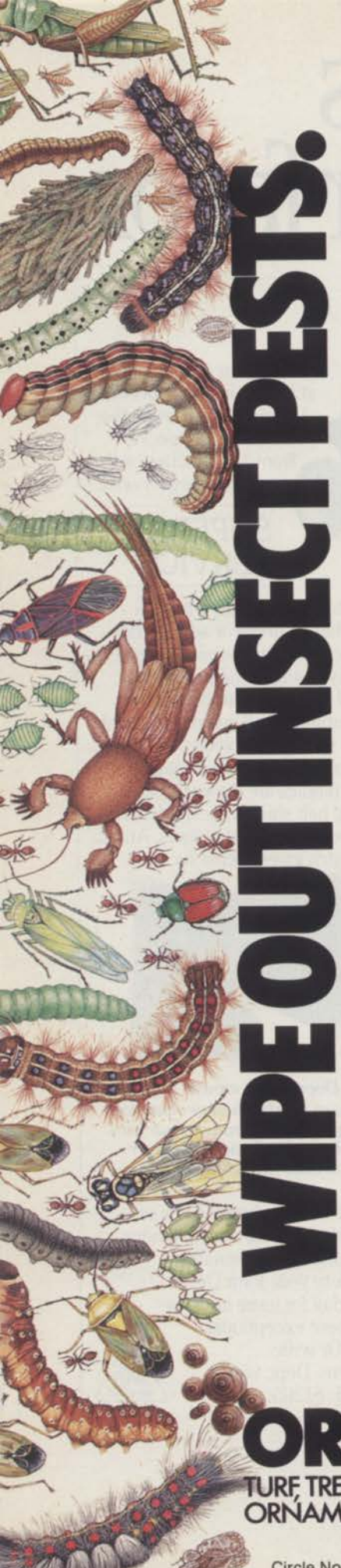
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ORTHENE kills both on contact and by systemic action. It makes the whole job of protecting lawns, golf course turf, trees, shrubs and flowers simpler, more convenient and more effective. Give yourself the edge against insects. Control them with ORTHENE Turf, Tree & Ornamental Spray.
Avoid accidents. For safety, read the entire label including precautions. Use all chemicals only as directed.
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figure off to 5,000 before the year 2000 and consider it one of the greatest challenges this organization has ever faced.

"It is also a tremendous challenge to the creative energy and talent of each one of us individually. The game has never been more popular than it is today, and it is our responsibility to meet that demand with more and consistently better work.

"I think it is time that we, the devilish architects of this glorious game, those of us who design those forbidding bunkers and undulating putting surfaces, join with the NGF, the GCSAA, the PGA, the TPC and the golf media to proclaim emphatically that we need 5,000 more golf courses in the next 10 years," Jones continued. "Because up to 70 percent of these new courses should be public rather than private, we especially need them in the cities, suburbs and counties."

Jones, 49, is the son of the ASGCA founder. His father and his brother Rees have previously served as ASGCA presidents. □

RIGHTS-OF-WAY

Rails-to-trails numbers 203

WASHINGTON — The number of rails-to-trails conversions in the U.S. has climbed to 203, and Americans used these trails an estimated 27 million times during 1988. This, according to statistics from the Rails-to-Trails Conservancy. Both numbers were up sharply from a similar survey last year.

"By every measure, converting abandoned rails to trails is an extremely popular issue, from Maine to California," says RTC program director Peter Harnik. "We know of at least 250 such campaigns under way right now and we learn of a new effort literally every day."

The states with the greatest rail-to-trail mileage are Wisconsin, Washington, Minnesota, Illinois, Pennsylvania and Iowa. The states with the largest number of trails are California, Illinois, Wisconsin, Washington and Pennsylvania.

Although there are no precise figures on how many miles of old track are available for trail use, the U.S. rail system has shrunk from about 300,000 miles in 1920 to about 165,000 miles today. Railroads continue to shed corridors at the rate of 3,000 to 4,000 miles per year.

For further information, to order one of the Rails-to-Trails Conservancy's publications or to become a member, write to the group at 1400 16th St. NW, Suite 300, Washington, DC 20036. □

CHEMICALS

New weapon in Dutch elm fight

HINSDALE, Ill. — Officials here have urged board members to employ Tempo 2 in the village's fight against Dutch elm disease, even though the product hadn't yet been approved by the Environmental Protection Agency against elm bark beetles.

Three of four Hinsdale Environment and Public Services Committee members voted to substitute Tempo 2 for methoxychlor, citing resident's complaints about the product, according to a *Chicago Tribune* report.

Board members said they will not solicit bids on the product until it was approved by the Illinois Department of Agriculture. □

GOLF

Architects develop formal request

CHICAGO — In an effort to simplify the bidding process for new golf course projects, the American Society of Golf Course Architects has de-

veloped a Request for Proposal form for new golf course projects.

The RFT is a condensed, 12-page document listing project specifics for the golf course architect. The brevity of the proposal, according to former ASGCA president Pete Dye, "simplifies the bidding procedure and encourages more course designers to respond to proposals."

The proposal is broken down into six streamlined categories: General Notice, Project Description, Scope of Services, Owner's Responsibilities, Submittal Requirements and Selection Process.

Copies of the RFP can be obtained by writing to the ASGCA, 221 N. LaSalle St., Chicago, IL 60601. □

MANAGEMENT

Marketing: best laid plans work

NASHVILLE, Tenn. — According to one market expert, the three realities in marketing are: how you see your company; how you think your customers see your company; the truth.

And to make sure you're telling the truth and being heard, target your markets wisely.

Mike Hiller, an associate with All-Green Management Associates, led a seminar on effective marketing during the last Landscape Expostion in Nashville, Tenn., and found that in many cases, marketing is mistaken for advertising. "You must distinguish the two," advises Hiller. "Advertising becomes part of the marketing plan after you decide who you want to reach, and what you want to say."

When developing a marketing plan, know the reasons why. Clarify those reasons in a mission statement that defines company philosophy and clarifies the nature of your business and its purpose, Hiller says. Then, follow through via tactically designed steps.

According to Hiller, key elements of a marketing plan include:

- timetables for implementation;
- an idea of the expected results;
- awareness of who is responsible for monitoring each step of plan;
- anticipated revenue per customer per year from the plan;
- a contingency plan or stop date in the event of failure;
- expected leads to be generated;
- closed leads needed to make the plan worthwhile.

Hiller says market segmentation variables can greatly affect a marketing plan.

"Do you know your target market? Who are they? Where are they? Why did they buy from you? There are more than 200 marketing variables we know of that go beyond the basic demographics of age, sex and income," says Hiller, including geographic location, psychological profile, benefit analysis and social segmentation.

"Target your market, be organized and know what your plan will cost," says Hiller. "Give your banker a reason to support you."

According to Hiller, "the marketing pie" of price, promotion, distribution and product has been modified. For the most part, says Hiller, lawn care customers aren't concerned with how you go about your work or the products you are using, as long as safety is a priority. From a product standpoint, you all do the same thing, so eliminate product as a marketing advantage. And if you market by price alone, you'll attract disloyal customers and more service calls. Research shows that homeowners care most about competence and results.

Effective promotion involves public relations, direct sales and advertising. Public relations lays the

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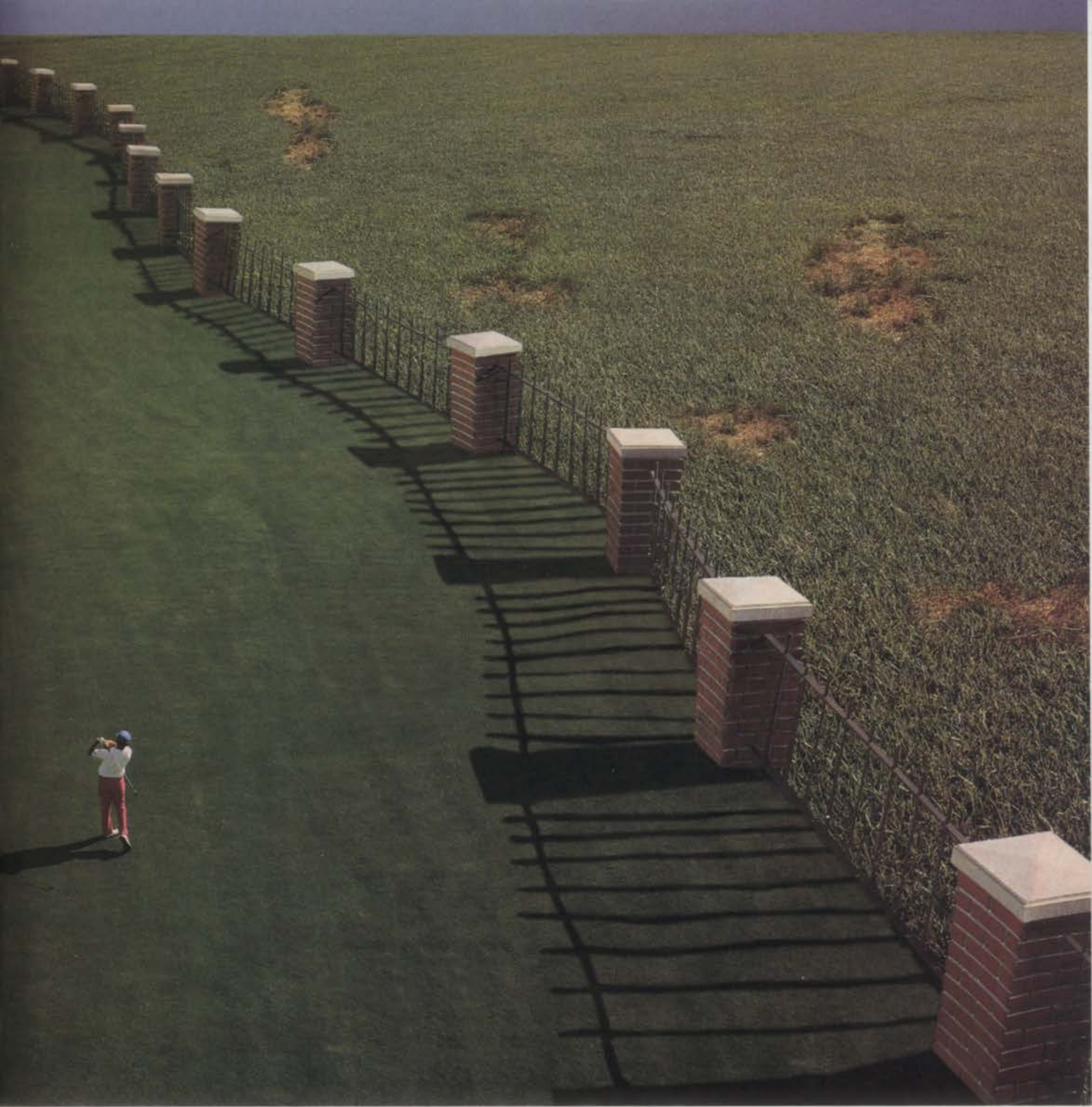

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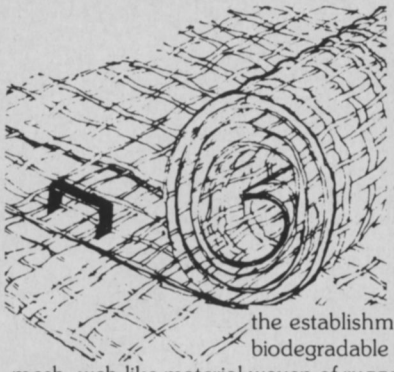

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groundwork for the future and builds credibility and image," Hiller says. If you want high visibility, join a local chamber of commerce or get involved in sponsorships.

And when you sell, don't sell jargon. According to Hiller, services rendered are often below customer expectations, causing customers to look elsewhere for service, "which is why some companies continue to find new customers in a saturated market." □

TREES

How many trees are in Texas?

COLLEGE STATION, Texas — How many native Texas trees have been identified and documented?

If your answer is 222, you guessed correctly, according to research scientist Benjamin Jackson Simpson, of Dallas, who has spent many years studying and writing about native trees found across the Texas landscape.

Simpson, who is with the Texas Agricultural Experiment Station, said the number could be 305 if one added current species, an additional 24 possible species, 51 natives that are considered shrubs and extinct or lost native trees.

Simpson, author of *A Field Guide to Texas Trees*, notes that Texas has from 33 to 45 percent of the native tree species in the United States,but little is known about the native species except among professional botanists and taxonomists. □

SEED

Noxious weed found in seed

WASHINGTON — Noxious weed seed has been found in tall fescue recently imported from Argentina, spurring a quarantine order from the government for all such seed in Oregon. Also, importers of the seed have been told to reclean, return or destroy the seed on hand.

The government reports finding 100 to 150 serrated tussock seeds per pound in Argentinian tall fescue. One importer, Pennington Seed Company of Madison, Georgia, reported distributing the seed to about 1,700 retail outlets all over the country. The lot numbers of Pennington seed being recalled are 83GSO3G and 83GSO1G. Other importers of the seed include Normarc and Olsen-Fennel, of Oregon, Seaboard Seed Co., of Chicago, Gateway Seed Co., of Missouri and Allied Seed Co., of Idaho.

Anybody in possession of tall fescue seed with Argentina listed as its place of origin, including seed mixed with Oregon ryegrass or Bermudagrass and coated with fungicide, should have the seed sampled immediately, says Roy Cole, senior operations officer with the U.S. Department of Agriculture's Animal Plant Health Inspection Service.

Tall fescue is in short supply this year as a result of last summer's drought, says Cole, which is why the seed was imported from a country the U.S. traditionally exports to.

"This has stirred up a lot of interest among state seed officials," says Cole. The seed sold was probably intended for highway rights-of-way, he adds, yet it poses its biggest threat in forage-type areas. "The weed has no nutritional value whatsoever. Animals consume it but can't digest it and eventually they die of malnutrition," says Cole.

Serrated tussock is a very aggressive, perennial, tussock-forming grass with a deep, fibrous root system. Called "the worst of noxious weeds" in the book *Economically Important Foreign Weeds*, the weed delivers an estimated 227 million seeds per acre and is nearly impossible to eradicate. □

EVENTS

MAY

18-19: Florida Nurserymen and Growers Association, "Landscape Color Magic," a look at landscape care and maintenance for Walt Disney World, Orlando, Fla. Contact: FNGA, 5401 Kirkman Rd., Suite 650, Orlando, Fla. 32819; (407) 345-8137.

25-29: Chicago International Festival of Flowers and Gardens, in Chicago's Lincoln Park. Contact: Cynthia Quick, managing director, 600 N. McClurg Court, Suite 1302A, Chicago, Ill. 60611; (312) 787-6858.

28-June 1: The International Geotextile Society's International Conference on Geotextiles and Geomembranes, to be held at The Hague, Netherlands. Contact: Secretary General G. den Hoedt, c/o Holland Organizing Center, 16 Lange Voorhout, 2514 EE, The Hague, Netherlands.

JUNE

4: University of Pennsylvania Philadelphia Garden Tour, a tour of six private gardens in Huntingdon Valley, Rydal and Meadowbrook. Contact: Pam Rorer, at the Morris Arboretum, (215) 247-5777, or Dr. H. Ralph Schumacher, Arthritis Section, Hospital of the University of Pennsylvania, (215)-662-2454.

6-8: Computer Aided Facility Management Conference, Anaheim Marriott Hotel, Anaheim, Calif. Conference will address various personal computer systems management and software topics. Contact: Nancy G. Mini, Director of Education and Research, IFMA, 11 Greenway Plaza, Suite 1410, Houston, Texas 77046; (713) 623-4362.

6-8: Techtextil Trade Fair, Frankfurt, Germany, presenting a wide variety of environmental protection products for agriculture and industry. Contact: Nicolette Naumann, (069) 7575-6415-6520.

7: California Association of Nurserymen will conduct a one-day tour of three retail and two grower operations in southern California. Tour begins at 8:30 a.m. Contact: Carol Freeman, 1419 21st St., Sacramento, Calif. 95814; (916) 448-2881.

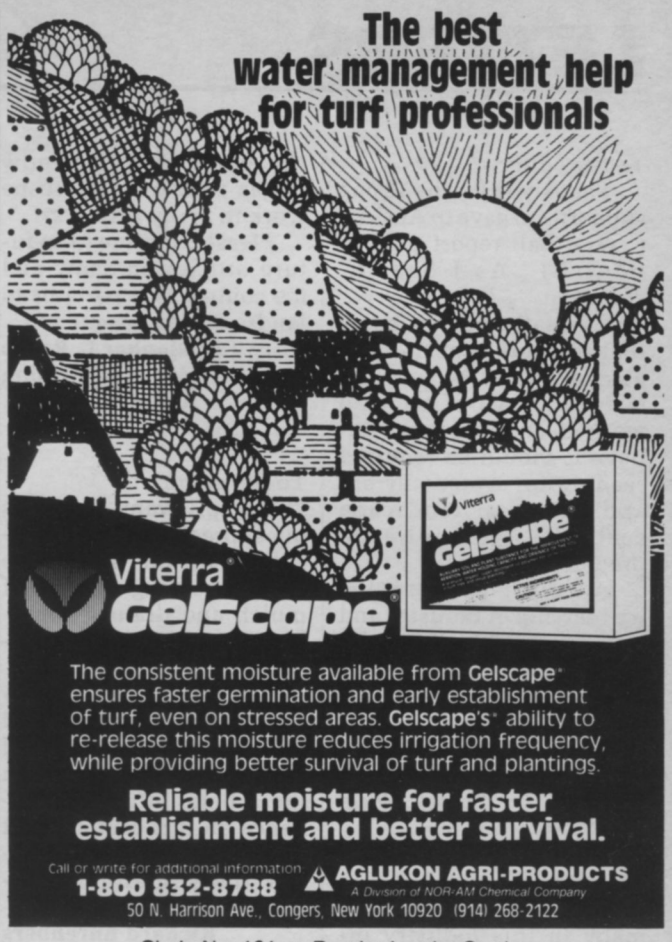
7-8: The Royal Agricultural Society of England's Landscape Industries '89, National Agricultural Centre, Stoneleigh, Warwickshire. Contact: Susan J. Bourne, International Relations Manager, 0203 696969, ext. 268.

9-11: Florida Nurserymen and Growers Association Convention, Ocala, Fla. Contact: FNGA, 5401 Kirkman Rd., Orlando, Fla. 32819; (407) 345-8137.

13-16: Grow America, "a new concept in horicultural trade shows," Nashville Convention Center, Nashville, Tenn. Contact: Vicki Miller, Executive Director, Grow America, PO Box, 3102, Glen Ellyn, Ill. 60138; (312) 790-3220.

15: Sports Turf Association's Educational Athletic Turf Field Day, River Oaks Recreation Centre, Oakville, Ontario. Contact: Doug Rigg, director of Oakville Parks and Recreation, 1225 Trafalgar Road, Box 310, Oakville, Ontario L6J 5A6.

17: North Carolina Turf and Landscape Field Day, North Carolina State University Turf Field Center and Arboretum in Raleigh. Contact: Betty Beaman, Turfgrass Council of North Carolina, (919) 467-8580.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LETTERS

To the editor:

Thank you for the strong support you gave to ALCA's Crystal Ball report in your (March) "As I See It" column.

It is satisfying to know that our work appears valuable to others like yourself. Naturally, all of us who worked on the report believe it should be required reading for every current and potential landscape contractor. Perhaps we are prejudiced.

Equally important is the partnership of industry and press committed to the growth of the industry. Your support of the industry is invaluable.

Thomas O. Lied
Lied's
Sussex, Wisc.

To the editor:

Because I am among the many in this industry involved in snow and ice control, I was extremely pleased to see the article "Emergency" in the February issue, even though the captions with the pictures were incorrect.

Our snow and ice work has grown over the years to the point that it is now larger than our landscape work in many respects.

Please continue to do future articles on snow and ice control as it pertains to landscape management.

Christopher L. Russo
Hampton Landscaping
Amagansett, N.Y.

To the editor:

I simply want to express my appreciation for the excellent article by George Scott regarding the use of mulch and drainage problems in the March "Research Update" column.

The article was extremely informative and deals with a problem that I am familiar with. Based on the article, future maintenence on this campus as it relates to mulching will follow the guidelines mentioned by Mr. Scott.

Richard Ehrenberg
University of Wisconsin
Whitewater, Wisc.

To the editor:

Your February 1989 article titled "Survival of the Fattest" certainly painted a slim picture of the landscape industry in Georgia.

Just last year the Extension Horticulture Department at the University of Georgia conducted a survey of the commercial landscape industry in Georgia. The survey, done in a scientific manner under the direction of a statistician, revealed over 45 firms statewide with annual billings in excess of $1 million, with 36 of these firms headquartered in metropolitan Atlanta. Yet your report showed only nine Georgia firms among the top 50. Should our industry feel slighted?

I assume your survey was based on whomever returned a questionnaire. If so, is it accurate journalism to describe these firms as the largest in the nation, or would it be better to list them as 50 of the larger firms that responded? Readers should be told that your survey was done simply to generate a list, not necessarily a complete list.

Gary L. Wade
Extension horticulturist
University of Georgia

According to some statistics, there exists nearly 30,000 landscapers in the U.S., a list that contains extensive daily changes as businesses are formed and others fold. Our mailing list includes 12,000 of the most successful, influential and stable of these companies.

Whereas a state-supported university may have the resources to scientifically poll all the landscapers within its boundaries, LANDSCAPE MANAGEMENT simply lacks the resources to poll every landscaper in the entire nation.

This is the fourth year we have compiled this list. Every year, we ask companies to contact us if they think their company qualifies. Every year, our list gets more complete. To our knowledge, Dr. Wade, this list represents the 50 largest landscape contractors in the nation.

Yes, there may be many companies out there which don't volunteer their names for the list; that's their prerogative.

Is this a scientific evaluation, though? No, you've got us there. But it's the best such list of its kind in the country, and we're proud of that.—Ed.

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ATHLETIC TURF

Do homework on sites

Consider several important factors *before* you begin construction of an athletic field, says Stuart Connock, a designer with Resource Planners, which specializes in athletic field construction.

For example, for what type of sport is the field intended? Do you need to meet the specifications of a governing board? How many spectators do you anticipate accommodating? How will the field be accessed for maintenance?

"These are all basic questions that will give you a better approach to the field," says Connock. He also believes you shouldn't underestimate the value of having soil tests done from the playing field and the areas surrounding it. "Testing the topsoil and subsoil is often sidestepped even though it's relatively inexpensive," says Connock.

As far as field design is concerned, it should lie north-to-south to avoid interference from the rising or setting sun. Make sure parking lots don't drain toward the field, that there is plenty of room for spectators and that they have a good view of the game, he adds.

STMA goes south

The Sports Turf Manager's Association will travel to Houston, Texas, for its second annual convention and trade show. The event will be held at the Wyndham Greenspoint Hotel for three days beginning on Jan. 19, 1990.

"We have an exciting program planned," says STMA president Steve Cockerham. "The trade show is expanded, and the outdoor equipment demonstrations continue to be a valuable part of our show."

Persons interested in attending the conference or in exhibiting at the trade show should contact the STMA, c/o R/K Communications Group, 3376 Eastern Ave., Suite 148, Las Vegas, NV, 89109 or call (702) 735-0000.

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Dimensions given are overall mower deck widths. Actual cutting widths are 38, 46 and 50 inches. A 60-inch deck (72.5 inches overall) is also available for the 430 only.

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COVER STORY

"Very short putting greens are like sidewalks," reminds David Fleming. Irrigation cycles must be timed accordingly.

SMART WATER

As irrigation systems near perfection and water use is regulated, 'systems management' takes on greater importance.

By Terry McIver, associate editor

"You can't just turn on a controller and say 'go ahead and water.'"

The words of golf course superintendent Brad Adams reflect what more professionals are learning about irrigation systems: management is everything. In today's world of tight-fisted water restrictions and sprinkling bans, the uniform and conservative use of water is increasingly important.

Bruce Augustin, Ph.D., of Lesco Inc., says water restrictions seem inevitable this year. He's concerned that irrigation systems that were originally intended to supplement Mother Nature have become the entire source of moisture.

"Most homeowners don't do anything drastic (to contribute to conservation)," he says. "As a consequence, they have in-ground systems that are rarely reset or calibrated. Time clocks, for example, will be set to come on every day, rather than perhaps every third day."

Golf course superintendents are also learning from experience. David Fleming, superintendent at Singing Hills Country Club in El Cajon, Calif., feels that supers sometimes find themselves putting water down in too many long cycles. He has tried to shorten watering cycles to allow for more soak time, taking into consideration the grass's height.

"Very short putting greens are almost like sidewalks, and the water tends to run off very rapidly," Fleming observes. "But for longer turf, you can go to eight or nine minute cycles."

Adams, over at Rancho California Country Club, thinks that most of the golf industry is "pretty much on the same wavelength."

"It's been proven over a number of years," says Adams, "that the more uniformly water can be put down, and the less water that can be put down, you will have a better quality turf and playing surface."

Irrigation system manufacturers second the notion of uniformity and control.

Ken Kline, manager of customer development for Toro Irrigation, believes one of the key factors relative to proper water distribution is managing all the variables.

"Control is one of the key things the industry is working on," says Kline, "and it's one of the things that

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Education soaks in

A major element in irrigation systems advancement has nothing to do with valves or pumps or evapotranspiration (ET) rates, at least not directly. More companies and associations now stress education as a key element in irrigation system efficiency.

Toro Irrigation's Ken Kline says the efforts made by manufacturers and the industry to educate people who are in the business of designing and installing irrigation systems has increased. He cites Toro's Certified Contractor's Program and the Irrigation Association's Certified Designer Program as examples.

The main purpose of education is to raise the professionalism of the entire industry.

"The principles of good design have been known for a long time," says Kline. "The current efforts are intended to disseminate that information to as many people as possible."

Many manufacturers' educational programs come into play locally. "Toro University," a week-long training session, gives distributors the tools and expertise to conduct training in their local areas.

—*Terry McIver* □

makes this industry so interesting and kind of difficult to be in."

There's always plenty of room for improvement, according to Ed Hunter, founder of Hunter Industries, "because uniform application of water is not as simple as you might think."

Hunter, one of the industry's irrigation pioneers, believes proper irrigation depends on even distribution at rates the ground can absorb.

"If you apply it too rapidly, or at too high a precipitation rate, the water will run from the high to the low spots, destroying the uniformity," Hunter notes.

Hunter says sprinkler systems which operate at lower pressure are ideal, because they result in lower energy costs.

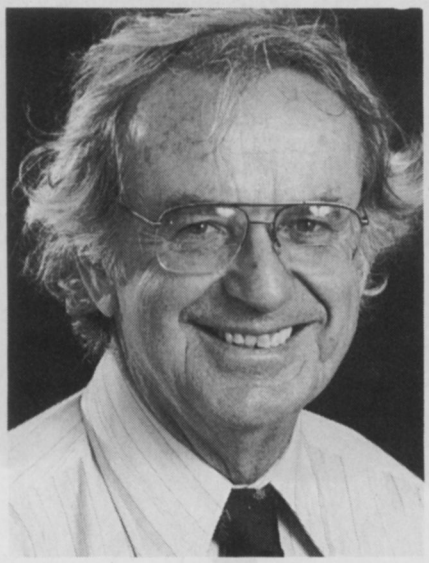
Gard Craw of Hunter told *Landscape Management* that even before the drought shocked everyone back to reality, the company always believed in products that perform at low pressure and at low application rates.

"Apply water as uniformly as possible at a rate more in line with soil intake rates so we can minimize waste," says Craw. "We (the green industry) suffer in times of water shortages, more so than car washes.

"We are of the opinion that you can have computer control, weather stations and moisture sensing devices, but if you don't carry that through to the most important component part—the sprinkler—all the rest are just bells and whistles. If the sprinkler is not applying water uniformly, what are you going to do as the manager of that system?"

The well designed, installed and managed irrigation system should:

- use that most valuable resource—water—most efficiently;
- be flexible in performance, with a variety of nozzles to adapt to conditions; and
- be able to operate at lower pressure. (Researchers are finding that low pressure means less wear and tear, fewer leaks and breaks, and less energy required to run the system.)



Ed Hunter: "Uniform application of water is not as easy as you might think."

"Every pound of pressure you use over what you actually need represents one percent more energy cost," says Fleming.

He has brought pumping energy costs at his 54-hole resort down from $140,000 to $74,000 by working on pressure efficiency, pump efficiency and scheduling. "Good equipment allows you to do that."

Fleming likes the Rain Bird Flo-Manager for ease of pressure control. It manages the flow demand placed on the pumping system while maintaining flow rates throughout the course to be consistent with piping network capacities.

Monitor the situation

Bill Pogue is president of The Irrometer Co. of Riverside, Calif. He believes soil moisture sensors, which have been used mostly by the agricultural segment, will be applied more to golf courses.

"Every year a few more superintendents buy manual sensors at the GCSAA show," Pogue observes. "Basically, they just look at them twice a week to determine if the soil is too wet or too dry.

"We're doing some engineering and design work right now to refine an electronic sensor to be hooked into an automatic irrigation system. This will let you control irrigation with soil moisture measurement technology without having to maintain it."

Pogue agrees that poor system maintenance is one of the biggest problems in the irrigation industry.

"Maintenance is critical to efficiency," he insists. "Water is conserved through proper scheduling, but you've got to start with an efficient system."

Toro Irrigation's new Soil Moisture Control System is designed to tell the controller when to stop irrigating rather than when to start. A ceramic soil sensor is made to dehydrate at a pre-set tension level close to the soil's moisture capacity.

Man and machine

"In actual practice, we've found that controllers are seldom adjusted because many managers lack the personnel or expertise to re-program them to follow precise changes in plant water use," says Steve Swenerton, Toro's director of sales and customer satisfaction. "In most cases the tendency is to over-irrigate since green industry managers are judged more on plant appearance than water savings."

As irrigation technology continues to reach new heights of sophistication, the human element will still remain.

"Computers were never intended to replace man entirely," says Kline. "But computers give us more time to manage. There will always be a need for a manager, someone who is aware of the variables that exist in a landscaping situation. There will always be a need for that input." **LM**

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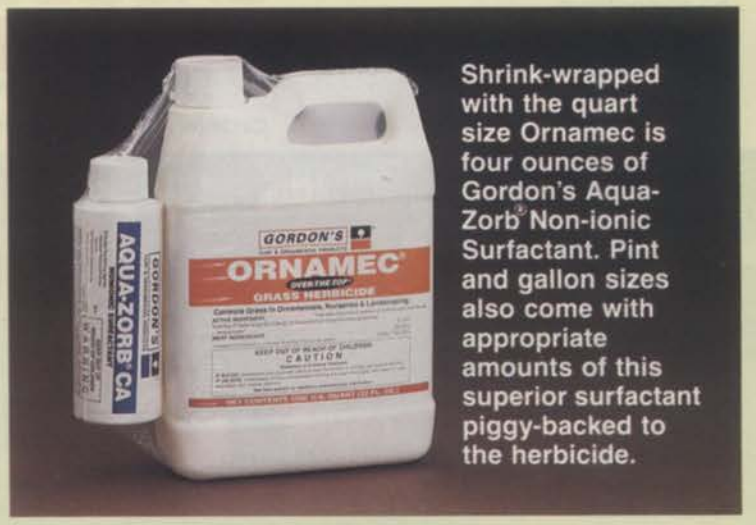

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PICTORIAL QUIZ . . . for landscapers and nurserymen: How are you going to get the unsightly, nutrient-robbing grasses out of the problem areas shown on this page? The answer is to spray over the top with Ornamec. It makes landscaping handiwork and nursery husbandry look good.

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Chives
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Cleyera (Cleyera spp.)
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Cotoneaster, Spreading
Cotoneaster, Willowleaf
Crabapple, Showy
Cranesbill
Creeping Charlie
Crossandra
Croton
Crown Vetch
Cypress, Allum lawson
Cypress, Cripps hinoki false
Cypress, Italian
Dagger, Spanish
Dagger, Weeping
Daisy, Shasta
Daisy, White African
Daylily
Densata
Deutzia, Slender
Dogwood, Cornelian cherry
Dogwood, Flowering
Dogwood, Red twig
Dumbcane, Giant
Dusty miller
Ellen Danica
Emerald mound
Eranthemum, Purple false
Escallonia fradessii
Escallonia rubra
Euonymus fortunei
Euonymus, Spreading
Euryops pectinatus
Evergreen, Fransher
Evergreen, Painted
Evergreen, Silver Queen
Evergreen, Treubii Ribbon
Fastadiata
Fatshedera
Fern tree, Desert
Fern, Sword
Fig, Creeping
Fig, Exotica weeping
Firecracker
Firethorn, Mojave
Firethorn, Variegated
Firewheel tree
Fir, Concolor
Fir, Douglas
Fir, Noble
Flaviramea
Forsythia intermedia
Forsythia sp.
Forsythia x intermedia
Forsythia, Weeping
Froebelii
Gardenia, dwarf
Gardenia, Tahitian
Gay-feather
Gazania gold rush
Gazania uniflora leucoleana
Geranium
Geranium, Ivy
Gimlet, Narrow-leaf
Gladiolus x hortulanus var.:
  Debbie
  Jennie
  Mahogany
  Stargazer
Gold drop (Potentilla f.)
Gold drop (Physocarpus f.)
Gold flame
Gold tip
Grapefruit
Green palo verde
Green stone crop
Gum, American sweet
Gum, Desert
Gum, Red
Gum, Red box
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Hawthorn, Indian
Heather, Scotch
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Hen and chickens
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Hetzi
Hibiscus, Chinese
Hollyhock
Hollywood
Holly, American
Holly, Dwarf Buford
Holly, Fosteri
Holly, Japanese
Holly, Meserve
Honey Locust/Shade master
Honeysuckle, Bush
Honeysuckle, Cape
Honeysuckle, Morrow
Hopseed bush, Purple
Hosta, Variegated
Hydrangea, Oakleaf
Hydrangea, Panicle
Ice plant, Purple trailing
Ice plant, Red spike
Ice plant, Rose
Inkberry, Compact
Iris sp.
Ironwood
Ivy, Algerian
Ivy, English
Ivy, Grape
Ivy, Hahn's
Ixora
Jacaranda
Jackmanni
Jacobinia ghiesbreghtiana
Japanese snowball
Jasmine, Asiatic
Jasmine, Star
Jessamine, Carolina
Jojoba
Judd
Juniperus procumbens
Juniper, Blue vase
Juniper, Gold coast
Juniper, Nicks compact
Juniper, Sargent
Juniper, Shore
Keteleeri
Lalandei
Lantana, bush
Lantana, Purple trailing
Laurel, Indian (F. microcarpa nitda)
Laurel, Indian (F. nitda)
Lavender cotton
Leptospermum laevigatum
Ligustrum, Wax
Lilac, James McFarlane
Lilac, Korean
Lily of the Nile, Peter Pan
Lily, Kaffir
Lily-of-the-valley bush
Liriope
Liriope, Green
Liriope, Variegated
Magnolia, Star
Mahonia
Manila Ripple
Maple, Japanese
Maple, Norway
Maple, Silver
Marigold (Tagetes sp.)
Marigold (Calendula sp.)
Mesquite, Chilean
Metallic plant
Mexican indigo
Mirror plant
Mirror plant, Variegated
Moneywort
Moon Glow
Morning-glory, Bush
Mother-in-law's tongue
Myoponum, Prostrate
Myrtle
Myrtle, Crepe
Myrtle, Wax
Nanum
Newport red
Ninebark, Dwarf 'Nanus'
Oak, live
Oak, Silk
Ocotillo
Odocanthus sp.
Oleander tree, Yellow
Oleander, Petite
Oleander, Pink
Oleander, Variegated
Olive tree
Olive, Russian
Ongerops, Acacia
Orange, Sour
Oregon grapeholly
Osmanthus, tea olive
O'Conners legume
Pachysandra, Japanese
Pagoda flower
Palibin
Palm, Canary Island date
Palm, Chinese fan
Palm, Golden fruited
Palm, Mediterranean fan
Palm, Mexican fan
Palm, Pygmy date
Palm, Queen (Acrecastrum r.)
Palm, Queen (Cocos p.)
Palm, Sago
Palm, Windmill
Parsley panax
Parsoni
Passion vine
Pear, Bradford
Pepin
Pepper, Brazilean
Pepper, California
Periwinkle
Periwinkle, Dwarf
Philodendron selloum
Philodendron, "Micans" velvetleaf
Photinia
Pine, African fern
Pine, Austrian
Pine, Black
Pine, Canary Island
Pine, Dwarf Swiss mountain
Pine, Eastern white
Pine, Mexican border
Pine, Norfolk Island
Pine, Ponderosa
Pine, Red
Pine, Scotch
Pine, Western
Pink clover
Pink lady
Pink weigelia
Pittosporum, Desert willow
Pittosporum, Wheelers dwarf variegated
Plumosa (Juniperus h.)
Plumosa (Chamaecyparis p.)
Plum, Natal
Polystichum capense
Primrose beauty
Privet, California
Privet, Texas
Pygmy, Crimson
Pyracantha graberi
Pyracantha, Lodense
Radiator plant
Raspberry ice
Red bud
Red fountain grass
Rheullia californica
Rhododendron "Gable Hybrid" var.:
  Elizabeth Gable
  Purple splendor
  Rose greely
Rhododendron catawbiense var.:
  Chionoides rhododendron
  English roseum
  Lees dark purple
  Purple elegans
  Roseum elegans
  Roseum superbum
  White catawba
Rhododendron formosa
Rhododendron obtusum var.:
  Amoenum
  Coral bells
Rhododendron spp. var.:
  Blaauw's pink
  Boule de neige
  Delaware Valley white
  Fashion
  Gibralter
  Girard's rose
  Gloria
  Greeting
  Gumpo pink
  Gumpo white
  Hahm red
  Herbert
  Hino red
  H. H. Hume
  Kaempo
  Kluis sensation
  Masasoit
  Mother's Day
  Pericat
  Pink pearl
  President Lincoln
  Prize
  Purple Gem
  Red ruffle
  Red wing
  Road runner
  Rosebud
  Royalty
  Rutherfordiana Constance
  Salmon spray
  Snow
  Stewartstonian
  Sweetheart
  Tabor
  Tradition
  White cascade
Rhododendron yedoense
  Korean azalea
  Poukhanense
Rock rose
Rose
Rose, Tea hybrid
Rosemary dwarf
Royal beauty
Rubber tree
Sage, Texas
Saltbrush
Salvia greggii
San Jose
Sandwort
Scarlet firethorn
Sedum
Sedum x rubrotinctum
Siebold
Silver King
Skandia
Snow in summer
Spider flower
Spirea, Billiard
Spirea, Crispa
Spirea, False
Spirea, Snowmound
Sprengeri
Spruce, Black Hills
Spruce, Blue
Spruce, Dwarf Alberta
Spruce, Norway
Spruce, Serbian
Strawberry, Ornamental
Swamp immortella
Sweet William
Thuja occidentalis var.:
  Emerald green
  Globosa
  Pyramidalis
  Techny
  Techny American arborvitae
  White cedar
  Woodwardii
Ti
Tomentosum
Torulosa
Viburnum (V. japonicum)
Viburnum (V. x rhytidophylloides)
Viburnum, Doublefile
Viburnum, Sandankwa
Viburnum, Compact cranberrybush
Viburnum/willowwood
Vicari
Waffle plant
Wandering Sally
Welleri
Willow, Australia
Willow, Tortuosa corkscrew
Willow, Weeping
Witchita blue
Xylosma senticosa
Yarrow, Common
Yarrow, Fernleaf
Yaupon, Dwarf
Yaupon, Tall
Yedda
Yellow bells
Yew pine
Yew, Dense
Yew, Hicks
Yew, Japanese
Yew, Thayeri
Yucca
Zinnia sp.

A MONUMENT TO THE PAST

Freddie Wong is caretaker for a pleasant public course on the Hawaiian island of Kauai. He likes its pace and heritage.

Multi-colored flora and historic rock formations are much in evidence at Kiahuna Golf Course.

Like its home state of Hawaii, Kiahuna Golf Course on the island of Kauai values its heritage and history. Just look down the first fairway and you see an original Hawaiian farmer's pigpen. Just to the side of another fairway is a stone monument left over from before the course was built.

The flora includes ancient banyan trees and a local shrubs called haole koa, from which herds of cattle used to feed.

The course is owned by Sports Shinko Co. Ltd., a Japanese concern. Owners have not fooled with the area's historical memorials.

"They've pretty much left the course alone," says superintendent Freddie Wong, a five-year veteran of the public course. "They aren't afraid to spend money. You just have to document everything."

Quiet pace

Wong spent his formative years as a superintendent with friend Mike Hathaway at Princeville Golf Course on another part of the island.

Freddie Wong thinks Hawaii can handle the increase in golf traffic.

"The pace here is quieter," says Wong, a master of understatement.

The course isn't long—6300 yards from the championship tees—but it's a difficult one. "Nobody has really torn the course up," notes Wong, adding that PGA touring pro Lee Trevino holds the course record, 65.

Tifway 328 Bermudagrass was used on greens, common Bermuda on tees and fairways. Greens are mowed at ⅛-inch, tees and fairways at ⅝-inch and roughs at 2 inches.

If there are agronomic problems with the course, they come in the areas of soil and weeds.

It seems the course was constructed over the solid rock pan so common on the islands. Wong notes that thousands of tons of dirt had to be imported to make a 1½-foot soil base over the rock pan.

Water everywhere

Because of the high water table caused by the rock pan, "drainage here is not the best in the world," the superintendent says. The course has 66 sand trips which "sometimes get standing water in them, but we've heard only good comments (about the condition of the course)."

Weeds include a local Bermudagrass called manenia grass (a blue-green-tinted turf) and goosegrass.

"We use MSMA and Sencor (metribuzin) for the goosegrass," says Wong. "We're not using anything with a restricted label."

Fertilization is performed five times per year, year round. The greens get 2 lbs. of nitrogen per month, 1 lb. with each application. Fertilizer is Lesco 31-15-0 for fairways and 21-4-11 + iron for the greens, purchased from Lesco rep Wayne Ogasawara. The fairway fertilizer was chosen for its high phosphorous content.

Fairways and greens are aerified in May and September to alleviate the compaction caused by the 156 rounds of golf being played per day. The aerifier is a Ryan.

Wong, 45, swears by Toro mowers because of the service he gets. He also uses Toro Irrigation equipment.

General manager of the course is Charlie Ortega. Assistant superintendent Dean Uyehara helps Wong supervise 14 grounds employees and two mechanics.

Boom!

Golf is booming in Hawaii, much as it is on the continental U.S. And Wong is as positive about the sport as his North American counterparts.

"I think we have enough courses here in Hawaii to handle the increasing traffic," he philosophizes. "They're building 25 new courses here. I think we're in a hot industry now.

"I always thought this was a crazy game until I became a golf course superintendent." **LM**

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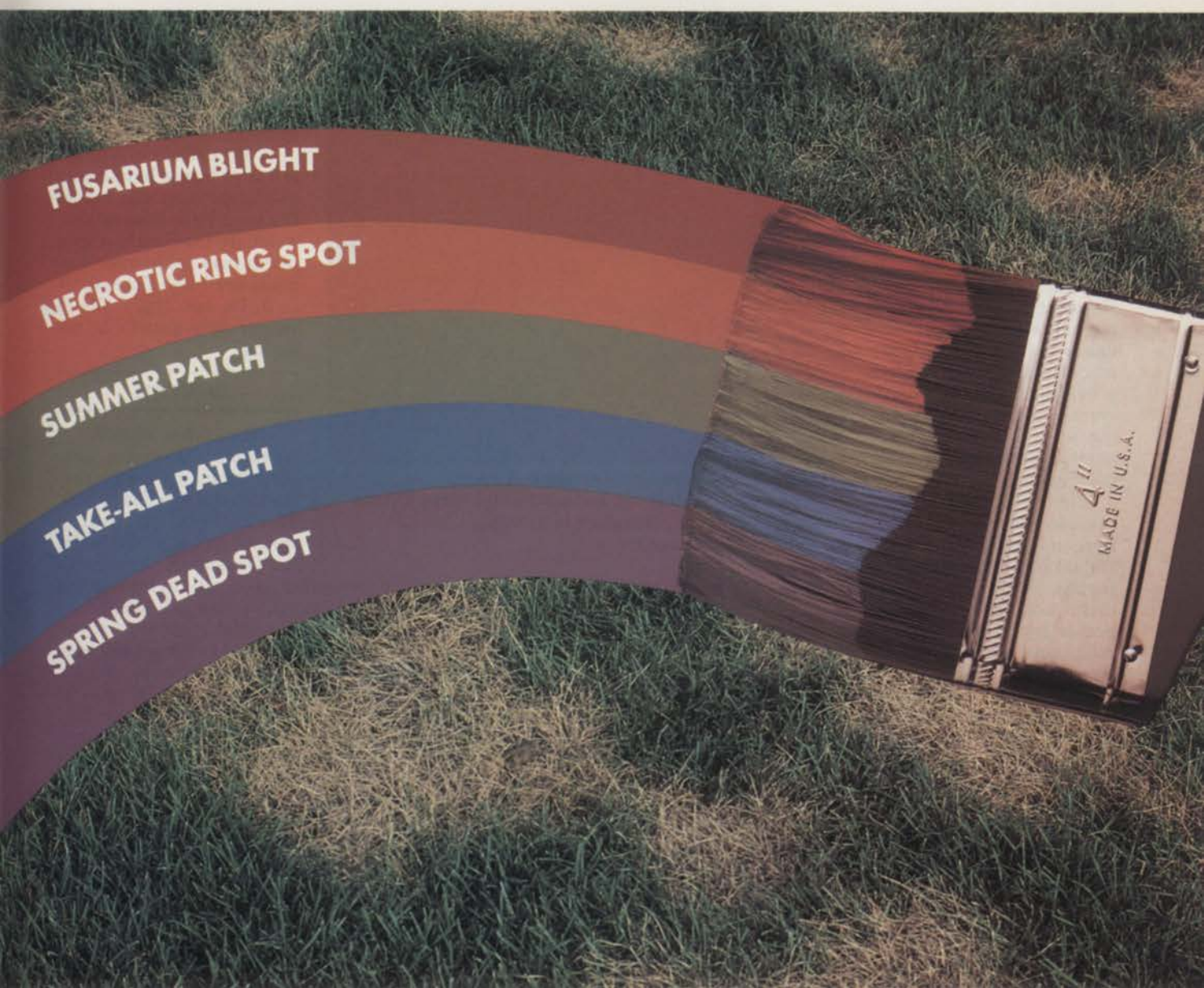

INSECT CONTROL FOR WOODY PLANTS

Insect control measures for woody plants can be quite involved. Here's a season-by-season strategy for battling the most common yet damaging pests.

by D. G. Nielsen, Ph.D., and J. R. Baker, Ph.D.

Trees and shrubs are valuable components of residential and commercial landscapes and other parts of our community and urban forests. Although they can add significantly to real estate values, poorly managed trees and shrubs may become a liability.

With proper attention to site selection, careful planting and scheduled maintenance, landscape plants are excellent investments providing many years of diverse benefits such as shading, screening, noise abatement, beautification and air purification.

The following guides discuss some of the most important arthropod (insect and mite) pests of trees and shrubs, and explain how to control them most efficiently. The information is organized by seasons to help you know when to implement pest management procedures.

(In all cases, whenever a pesticide is used, the practitioner should read the label on the container before the insecticide, miticide or other pesticide is used.)

If the plant is under water stress and aphid numbers are building up, an insecticidal spray should be used to prevent premature leaf drop on valuable specimen trees.

Control tactics

Some insect and mite pests are vulnerable to control tactics after plants have become acclimated to winter temperatures. Landscape managers can capitalize on this window of opportunity by performing pest control functions when other maintenance activities are not competing for their time.

Horticultural spray oils can be used safely on a variety of woody plants to control overwintering stages of spider mites, aphids, adelgids, and armored scales.

Oils can be used throughout the year whenever the temperature is above freezing and plants are not under moisture stress, except when the new growth has just emerged and the leaves are tender. The following cautions should be considered before and when using oils to control pests on trees and shrubs:

1. Read the label to make sure the product is not phytotoxic to the plants to be sprayed.

2. Do not use oils in the fall after leaves have begun to change color and before the trees have become dormant. (In the South, woody plants may not become dormant until late December).

3. Do not apply oils to tender new growth in the spring.

WINTER

November-March

Adelgids are small, soft-bodied sucking insects that feed on the needles or bark of conifers, including spruces, pines, and Douglas fir. On spruce they cause pineapple-shaped galls to form on the base (Eastern spruce gall adelgid on Norway and white spruce) or at the terminal end (Cooley spruce gall adelgid on Colorado spruce) of new growth in the spring. On Douglas fir they feed on the underside of needles, causing needle distortion and minor chlorosis.

Most adelgids overwinter as young nymphs on the undersides of branches or needles. Pine bark adelgids overwinter as eggs, nymphs, or adults in bark cracks and crevices on white pine. Copious production of fluffy filaments by nymphs and adults often cause trunks of white pine to be

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almost solid white. This population density can debilitate a tree, reduce growth rate and cause tree decline.

Adelgids can be controlled on spruces any time after galls open in late summer until just prior to bud break the following spring.

Every effort should be made to get the toxicant (spray) to the underside of branches where the overwintering stage is located. Horticultural oils may provide good control, but they often remove the bloom from Colorado spruce that gives them their blue cast. Although the bloom will return later in the year, customers are commonly upset when their blue spruce changes color following a pesticide treatment.

Sevin or lindane, applied as a thorough-coverage, hydraulic spray, provide excellent control of adelgids. Recent studies have shown that some of the newer synthetic pyrethroids and Safer's insecticidal soap show promise for controlling adelgids. Be sure to check the pesticide container label to determine that the pest target and its host are cleared for the intended use.

Mite control

Spider mites, including spruce spider mite on coniferous evergreens and southern red mite on hollies, azaleas and other broadleaf evergreens, remove plant juices and deposit silk and waste material on their hosts, causing leaves to become dull and bronze colored.

Most mite feeding damage is done in spring and fall when temperatures are not extreme. They overwinter as eggs, which are usually susceptible to control with horticultural oil used at the dormant season rate.

Be especially watchful for damaging spider mite populations during and following periods of drought. Spider mites were a serious problem during the drought of 1988 and may be abundant again in 1989.

False spider mites are tiny, flat organisms that feed and reproduce slowly throughout the year in the South. Most "winter injury" symptoms on aucuba, azalea, and Japanese hollies are due to feeding by false spider mites.

Horticultural oil and other miticides give adequate control of these pests. Treatment is appropriate at any time of year except in early spring when new, tender growth is emerging.

Aphids are small, soft-bodied sucking insects that insert their mouthparts into the phloem of leaves, stems, and roots to remove sap. They excrete honeydew, a sweet, clear liquid that coats heavily infested plants and drips on cars, walkways, and other surfaces, often causing severe nuisance problems.

Aphid damage

Honeydew serves as a substrate for sooty mold fungi that reduce the aesthetic appeal of host plants and limit their ability to manufacture food through the process called photosynthesis. Some species (melon and apple aphids) feed on the most succulent part of the plant. Others (giant willow, giant bark, and Cinara aphids) feed on stems.

Large caterpillers are difficult to control with insecticides. After they have finished feeding there is little justification for applying one.

High aphid populations can cause leaves to yellow and fall prematurely. Many aphids overwinter as exposed eggs on conifer needles or on stems and buds of other kinds of woody plants. If damaging aphid populations were present the previous summer or fall, an application of horticultural oil before bud break will reduce the spring aphid population, thereby giving the tree a chance to recover before aphids build up again during the following spring and summer.

Soft scales are another kind of sucking insect that drains a tree's energy and reduces its ability to manufacture food by producing honeydew, on which saprophytic sooty mold fungi grow. Heavily infested tulip trees or agnolias may be killed outright by soft scales.

Soft scales that overwinter as nymphs (including cottony maple, cottony maple leaf, magnolia, pine tortoise, and Fletcher scales) are at least somewhat vulnerable to horticultural oils during the dormant season. Even a moderate level of control during the dormant season will be beneficial, because soft scales consume copious amounts of plant fluid in the spring and summer before completing their development and before the highly vulnerable crawler stage is present.

SPRING

(April-late June)

Most insects become active in the spring, responding to warmer weather and resumption of plant growth and development. Monitoring trees and shrubs or pests during this time is one of the most important tactics in rational control programs.

Newly-expanding or expanded leaves should be checked for the presence of sucking insects and mites, leafminers, and defoliators. Tree limbs and trunks should be inspected for presence of active borer galleries as evidenced by sawdust or oozing from entrance holes.

Although borer sprays are not effective after the larvae have become established beneath the bark surface, spring is a good time to determine if plants are infested, so appropriate plant health care and direct insect control practices can be implemented when they will be most successful.

Defining defoliators

Insects that consume foliage are commonly called **defoliators.** They are one of the earliest insects to become active in the spring. Eastern tent caterpillar, whitemarked tussock moth, fall cankerworm, and some pine sawflies seem to begin feeding even before we notice new leaf growth.

At times, their populations are high enough to cause significant defoliation.

Commonly, their presence and the webbing that tent caterpillars produce an unsightly appearance. If the infestation is not noticed until much of the plant has already been defoliated, it may be too late to use a direct control measure that season.

Large caterpillars are much more difficult to control with insecticides, and after they have finished feeding there is little justification to apply a control measure. Instead, they should

Handle your grub situation fast, before things get really ugly.

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be controlled during their next generation while caterpillars are still small.

Most lepidopterous defoliators (moths and butterflies) and hymenopterous foliators (sawflies are relatives of bees and wasps) are susceptible to insecticidal control. Sevin, Orthene, diazinon, Dursban, Turcam/Dycarb, malathion, Dylox, and synthetic pyrethroids are all effective against lepidopterous defoliators.

Preparations of the bacterium, *Bacillus thuringiensis*, more commonly known as Bt, are also effective against these pests, especially if used when larvae are small. The hymenopterous sawflies are susceptible to Sevin, Orthene, Dursban, and synthetic pyrethroids.

Elm leaf beetle larvae and adults consume elm foliage throughout the spring and summer. They overwinter as adults, lay eggs on the underside of leaves in the spring, and complete two generations per year throughout much of their range.

Sevin, Orthene, Turcam/Dycarb, and synthetic pyethroids are effective against both larvae and adults, as is a new strain of Bt known as "San Diego." Furthermore, Sevin or a synthetic pyrethroid sprayed on elm trunks just prior to the descent of the mature larvae of the first generation kills many of the larvae and may reduce defoliation by the second generation. This tactic can be expected to have best results when an entire neighborhood is treated.

Trunk spraying might be especially useful in areas like Manhattan, New York, where canopy spraying is not permitted.

Armored scales are soft-bodied, sucking insects that remove plant fluids from stems, leaves, or roots. They do not produce honeydew, but may become numerous enough to dramatically reduce plant vitality or even cause its death. They are called armored scales because after the first nymphal stage has molted, the succeeding stages are protected by its shed skin and the secreted "test" or armor.

Scale protection

Pesticidal sprays that are effective against active crawlers and settled first nymphs are usually ineffective once the nymph has molted and is protected by the test. Consequently, one window of opportunity to control armored scales should be when they are crawlers or newly settled nymphs.

Determining when this occurs requires close inspection of infested plants with the aid of magnification device such as 10x hand lens. (To use a hand lens, hold the lens near your eye, and stabilize it by pressing the side of your thumb gainst your cheek. Then, bring infested foliage into focus by moving it toward the lens.)

Plants infested with armored scales should be sprayed after all crawlers have hatched. The only way to determine when this has occurred is to check for crawler hatch and to overturn female coverings to make sure eggs are no longer present. This procedure works well for those armored cales that overwinter as eggs, including pine needle scale and oystershell scale.

Pine needle scale can be controlled with a single application of an effective insecticide applied sometime in late April or early May, depending upon your geographical area. Oystershell scale crawler hatch occurs at different times on different hosts within any one geographical area. Also, hatch on a single host plant occurs over a period of at least two weeks in some parts of the country. Therefore, two applications spaced about 10 days apart, beginning several days after first crawler hatch in late May or early June, are required to achieve successful control of this pest.

Euonymus scale, which attacks both euonymus and pachysandra overwinters as inseminated females, and crawler hatch is protracted in the spring. Before spraying, prune out the most heavily infested branches if feasible. Two or three applications of Cygon or another effective insecticide, spaced at 10 day intervals, beginning several days after first crawler hatch, are required to control this pest. In all cases, high pressure, high volume sprays should be used to control all armored and most soft scale infestations.

All armored scales that have more than one generation per year (pine needle, euonymus, and white peach scales) should always be controlled during the spring crawler hatch, because the hatching period is shorter at that time and fewer pesticide applications are required to provide control. Orthene, diazinon, Dursban, and Sevin have been used to control armored and soft scales for a number of years.

During the past three years Safer's insecticidal soap has been the best product against pine needle scale crawlers in tests in Ohio. It should be equally effective against other scales if applied as a thorough-coverage spray during the crawler and first nymphal stages.

Horticultural oil

Horticultural oil may also be effective against armored scale crawlers and settled first nymphs. Be sure to check the container label to determine that the product is labeled for the specific target pest on the host that will be sprayed.

Aphid populations can explode since a new generation can be produced every 10 to 15 days in the North and even faster in the South. In the North, they are often at damaging population density during summer drought or just after a drought. Check the underside of leaves periodically, especially during hot, dry weather to determine if aphids are present and whether their population is increas-

Preventive maintenance still the best defense

Plants growing on undisturbed, native sites are often vigorous and suffer little from attack by insects, mites, or pathogens. However, many landscapes are on disturbed or non-adaptive sites like city streets, parking lots, malls and parks. In these places human activities or harsh environmental factors decrease the vitality of trees and shrubs and they are commonly attacked by damaging organisms that further decrease their aesthetic appeal and longevity.

Many insects and mites are opportunistic in that they cannot successfully attack a healthy tree or shrub. Therefore, the first line of defense against these opportunistic pests is to keep trees and shrubs healthy and vital. This can be done by preventive maintenance in the form of plant health care.

Preventive maintenance includes mulching trees to keep mowers from wounding the bark; irrigating during summer and fall droughts; aerification of the soil to provide oxygen to roots; and proper fertilization (following the directions of a soil test report). Still, some pests such as the Japanese beetle can attack perfectly healthy host plants. The landscape manager will have to directly intervene to prevent damage that may threaten plant beauty or survival. □

—the authors

The details show that even as Bunton mowers improve they still remain the same.

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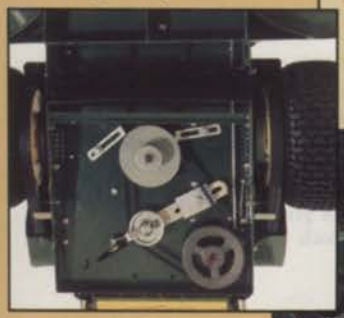

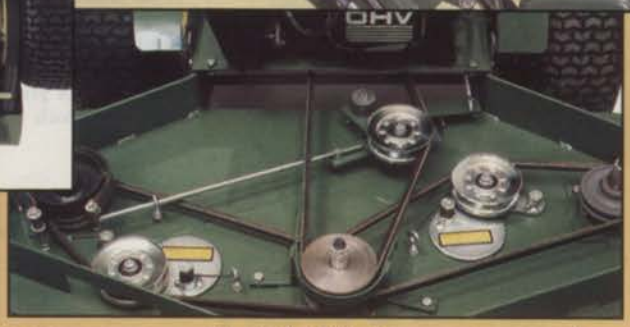

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Clearwing moth borers are common in ash, dogwood, flowering fruit trees, lilac, oak and rhododendron. Borer larvae feeds beneath bark.

ing. If the plant is under water stress and aphid numbers are building up, an insecticidal spray should be used to prevent premature leaf drop on valuable specimen trees.

Be sure to thoroughly irrigate plants under moisture stress before applying a pesticide to avoid pesticide injury to the plant. In the North, aphid impact is most common on maples and oaks. In the South, aphid populations are often high in late winter and early spring before lady beetles and other predators become active and abundant enough to provide control.

On the other hand, crape myrtle aphid populations often become damaging later in the summer. Mistblower applications are excellent against free-living aphids. Insecticidal soaps are registered for use against aphids on shade trees and shrubs, but they have not been effective by themselves against the common birch aphid.

Soaps may be more effective when combined with horticultural oil or a conventional insecticide. There are many other aphicides labeled for use in nursery and landscape management.

Lindane kills adelgids

Overwintering **adelgids** can be controlled by using hydraulic application of lindane or Sevin, stressing coverage to the underside of branches and leaves before budbreak. Cooley spruce gall adelgid on Douglas-fir is most vulnerable to contact action when the insecticide is sprayed just when the bud scales are being pushed away from expanding needles.

Once buds have broken, adelgids on spruce are protected within galls. They do not become vulnerable again until the gall matures, splits open and new adelgids emerge to mate and lay eggs the following August or September.

Birch, boxwood, and holly **leafminers** are highly specialized insects whose larval stages injure trees and shrubs by destroying leaf tissue. The results of their activity is analogous to that caused by defoliators.

Birch leafminer is a sawfly (related to honey bees) that overwinters in cocoons in the soil. Adults emerge in

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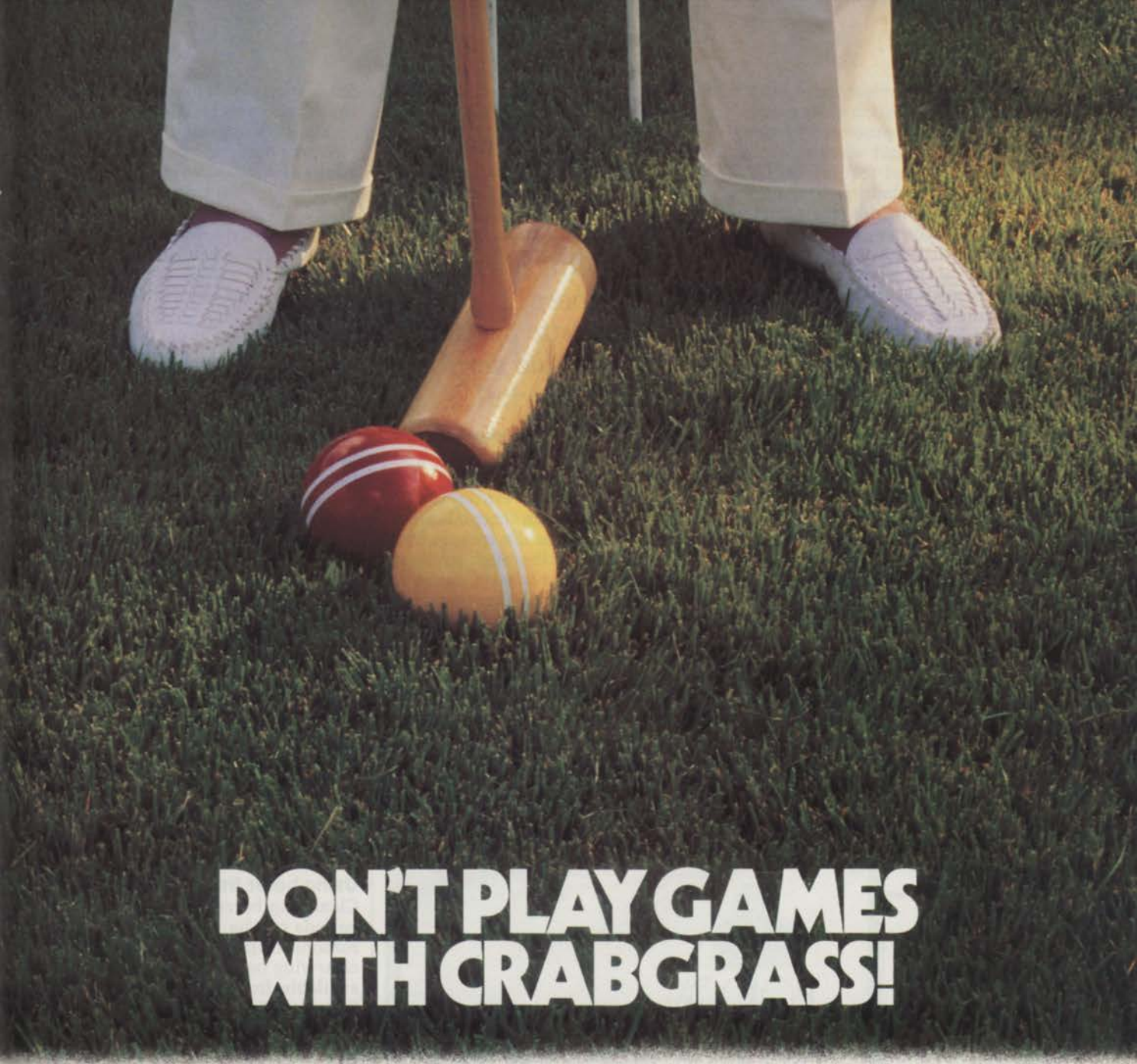

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May; there are three or more generations per year in much of its range.

Foliage can be protected by spraying when the adult sawflies are actively mating and feeding on birch leaves. Sevin, malathion, lindane and synthetic pyrethroids are effective when used before eggs are deposited within leaf tissue. After egg laying has begun or mines have formed, a systemic insecticide like Orthene or Cygon should be used.

Holly leafminer is a true fly that overwinters in the larval stage within mined leaves and emerges in May. Spring application of Orthene, diazinon, Dursban, Sevin, or a synthetic pyrethroid is effective before eggs are laid. After oviposition has begun, Orthene should be used to kill newly established larvae.

Boxwood leafminer is a gall midge that also has just one generation per year. A mid- to late-spring application of Cygon will provide adequate control of this pest.

What to use

Spider mites, such as two-spotted spider mite and tumid mite, are common and damaging on plants under water stress and during long, hot summers. They complete many generations throughout the spring and summer.

Kelthane, Mavrik, Talstar, Soap and Pentac are usually effective against spider mites. Whenever a product is used that does not kill mite eggs, you must make two applications at a five day (South) or ten day (North) interval to achieve an acceptable level of control. A hydraulic sprayer must be used to insure thorough coverage, especially for plants with dense foliage like foundation plantings, conifers, and other evergreens.

The first line of defense against these opportunistic pests is to keep trees and shrubs healthy and vital.

Root weevils (black vine, strawberry root) can be destructive in both adult and larval stages. Adults chew notches in leaf margins. Larvae consume small roots and debark larger roots, sometimes causing death of foundation plants like rhododendron, azalea, and yew (taxus).

The best approach for controlling root weevils is to spray foliage after adults emerge above ground in spring and summer but before they begin to produce eggs. Hydraulic sprays of Turcam/Dycarb, Mavrik, Talstar or Tempo 2 should begin in mid-June, followed by repeat applications at three to four week intervals until August.

Every effort must be made to achieve thorough coverage, spraying all adult hosts, including conifers, taxus, rhododendrons and azaleas, euonymus, hosta, Japanese holly, etc.

Level of control is directly related to degree of coverage and following through with repeat applications at three to four week intervals. Drenching soil beneath host plants during the August adulticide application may help reduce larval populations.

Clearwing moth **borers** are common in ash, dogwood, flowering fruit trees, lilac, oak, and rhododendron. Flatheaded borers (adults are called metallic wood borers) are common in oaks, white barked birches, and other stressed hardwoods.Borer larvae cause damage by feeding beneath bark, disrupting movement of water and sugars, destroying the cambium (the cells that give rise to lateral growth), and reducing structural integrity.

Using borer traps

Clearwing borer presence and flight periods can be monitored with pheromone traps. These cost-effective clearwing borer monitoring traps are available from: Trêcê, Incorporated, P.O. Box 5267, Salinas, CA 93915; Great Lakes IPM, 10220 Church Road N. E., Vestaburg, MI 48891; Scentry Monitoring Products, P.O. Box 426, Buckeye, AZ 85326-0090.

A four trap kit costs about $35 and will be efficient to monitor clearwing moths throughout your service area for an entire year.

A single, thorough-coverage bark spray of Dursban or lindane, 10 to 14 days after first male moth capture, will provide season long control of most clearwing moth borers.

Three applications of bark/foliage sprays with Turcam/Dycarb, Dursban, or lindane are required to control flatheaded borers.

The first application should be made just prior to first adult emergence (some time in May). Bark and foliage should be sprayed because adults feed on leaves for several days before they begin egg production. **LM**

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by Monsanto

EXPEDITE™: THE PROFESSIONAL SYSTE

PROfessional system of solutions

Expedite provides a complete pesticide delivery system, consisting of specially formulated, premixed pesticides and an application lance. Designed to solve a variety of application problems with ease and convenience, Expedite offers professional results through an advanced spray application technology. Additional chemistry is being developed to expand the Expedite product portfolio.

PROgrammable control and accuracy

Easy-access controls on the Expedite lance let you adjust swath width, droplet size and flow rate for precise, accurate spraying. Two application discs let you match spray patterns to varying situations. Plus, the built-in pacer control allows for consistent walking speed and accurate calibration. It all adds up to efficient, low-volume spraying you can program for superior performance.

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Both the Expedite grass and weed herbicide and broadleaf herbicide are specially formulated to provide effective control of labeled weeds. And the visible spray pattern lets you see exactly where you're spraying for improved accuracy. As a result, you can count on Expedite for general trimming and edging, spot treatments and broadcast applications.

M TO SIMPLIFY PESTICIDE APPLICATION

PROfitability improves
Cost-effective Expedite lowers your expenses by making spraying a fast, efficient, one-man operation. Downtime is substantially reduced and so are additional equipment and application costs. The premixed chemicals are designed to eliminate mixing errors and waste for even more savings.

PROtects your workers
Expedite provides a closed system, and is designed to reduce worker exposure to pesticides. Ready-to-apply formulations come in specially designed 5-liter cartons that fit right into the backpack, so there's no exposure from mixing. Cleanup is simple and easy. And the lightweight Expedite lance and backpack minimize worker fatigue.

PROductivity increases
Expedite puts an end to time-consuming stop-and-start spraying. There's no mixing, measuring, water hauling or pumping. In fact, one 5-liter pack of Expedite pesticide covers up to one acre—the same as refilling a 3-gallon backpack sprayer 28 times! Just hook up, prime and spray—faster and farther than ever before.

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  - Square — for trimming, edging and spot treatments (6″-24″ swath)
- Disc Ejector Tool
- Calibration Cup
- Backpack
- Battery Recharger Pack
- Pesticide and Cleaner Formulations

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Our **90-DAY GUARANTEE*** assures a full refund if you're not satisfied with Expedite equipment or pesticides. In addition, our **ONE-YEAR WARRANTY*** covers all Expedite lance parts and repair costs for one year from the date of purchase.

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Solve your pesticide application problems like a pro, with the new system of solutions: **EXPEDITE.**

For more information about Expedite call toll-free

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***For complete details refer to the warranty provided with the Expedite lance.**

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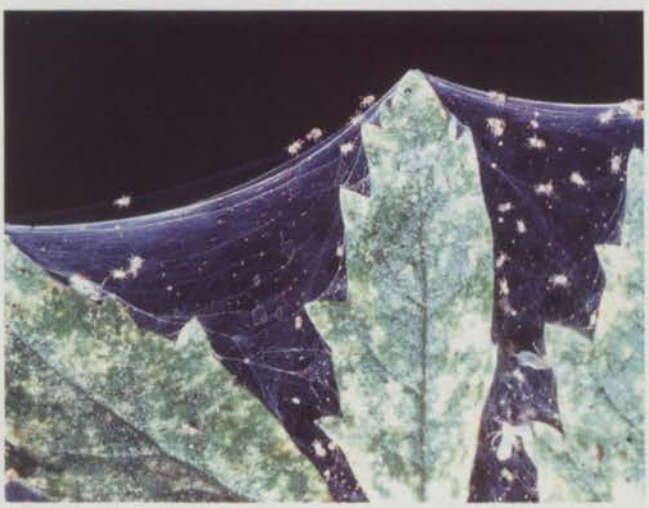
EXP-9-100

SUMMER/FALL CONTROL OF ORNAMENTAL PESTS

Drought conditions have had a great impact on pest populations. Early detection is the key to successful control at this time.

by J. R. Baker, Ph.D., and D. G. Nielsen, Ph.D.

Plants infested with armored scales should be sprayed after all crawlers have hatched. The only way to determine when this has occurred is to check for crawler hatch and to overturn female coverings to make sure eggs are no longer present.



Woody plants, such as some euonymus varieties and roses, are frequently infested by two-spotted spider mites and tumid mites. These pests are dispersed on air currents and may appear suddenly in large numbers during hot, dry weather.

The summer season (July through September) is when many of the most damaging landscape pests get down to serious business. Mimosa webworm, bagworm, fall webworm, Japanese beetle adults and second generation elm leaf beetle sometimes become common in early summer. All of these pests should be controlled when larvae are small to minimize damage and to maximize effectiveness of the insecticidal spray.

These pests are known as defoliators. This group includes caterpillars, which can be controlled with BT or one of the conventional products listed previously (under defoliators in spring).

Insecticide application by mistblower, though cost effective, may result in unacceptable drift of sprays to neighboring properties. In addition, they should not be used when it's windy.

Beetles prevalent

Japanese beetle adults feed on many kinds of trees, shrubs and roses in July and August. They are most easily controlled with weekly sprays of Sevin, Turcam/Dycarb, or one of the synthetic pyrethroids.

Area-wide grub control is the most effective way to reduce the number of Japanese beetle adults locally, thereby minimizing defoliation of nearby woody plants.

Second generation elm leaf beetles can cause significant defoliation if heavily infested trees are not sprayed or bark-banded with Sevin or a synthetic pyrethroid when first generation larvae begin to descend tree trunks.

Birch leafminer can be controlled during summer if trees are sprayed when second or third generation adults are mating and ovipositing. Remember, after egg laying has occurred and mines have begun to develop, only a systemic material like Orthene or Cygon will control leafminers.

Crawlers of several soft scales (Fletcher, cottony maple, cottony maple leaf, pine tortoise, wax and tulip tree) hatch in late June or early July

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INSECTICIDE DIRECTORY

INSECTICIDE/MITICIDE DIRECTORY FOR LANDSCAPE USES

COMMON NAME	TRADE NAME	COMPANY	USES
acephate	Orthene	Valent	aphids, bagworms, black vine weevil, cankerworms, eastern tent caterpillar, fall webworms, lace bugs, leaf rollers, scales, webworms.
Bacillus thuringiensis (Bt, BT)	Dipel SOK Bt Thuricide	Abbott Nor-Am Sandoz	bagworms, cankerworms, fall webworms, gypsy moth, io moth, loopers, mimosa webworm, oleander moth, omnivorous leafroller, saddleback caterpillar, tent caterpillars, tobacco budworm.
bendiocarb	Ficam Dycarb Turcam	Nor-Am Mallinckrodt Nor-Am	bagworms, black vine weevil, cankerworms, eastern tent caterpillar, fall webworms, Japanese beetles, momosa webworm, yellownecked caterpillar.
bifenthrin	Talstar	FMC	aphids, bagworms, black vine weevil, caterpillars, fall webworms, Japanese beetles, lace bugs, leafhoppers, leafminers, leaf rollers, loopers, mealybugs, spider mites, whiteflies.
carbaryl	Sevin	Rhone-Poulenc	bagworms, cankerworms, eriophyid mites, Japanese beetles, June beetles, lace bugs, leafhoppers, leaf rollers, mealybugs, sawflies, scales, tent caterpillars.
chlorpyrifos	Dursban	Dow	aphids, bagworms, clearwing and flatheaded borers, eastern tent caterpillar, fall webworms, leafhoppers, lilac borer, mealybugs.
fenitrothrion	Sumithion	Sumitomo	fall webworms, mealybugs, southern red mites.
fluvalinate	Mavrik	Sandoz	aphids, caterpillars, leafhoppers, lygus bugs, mites, whiteflies.
lindane	Lindane	Drexel	borers, lace bugs, leafminers, spittlebugs.
malathion	Malathion	Cyanamid	aphids, bagworms, Japanese beetles, lace bugs, mealybugs, scales.
methoxychlor	Marlate	Kincaid Enter.	cankerworms, Japanese beetles, leafhoppers, tent caterpillars.
oil	Hort oils etc.	several	scales, especially armored scales, mealybugs, red spider mites, whitefly larvae.
oxamyl	Vydate	Dupont	aphids, black vine weevil, Japanese beetles, leafhoppers, leafminers, mealybugs, mites, scales, whiteflies.
oxythioquinox	Morestan	Mobay	mites, mite eggs, whiteflies.
phosmet	Imidan	ICI Americas	asphids, cankerworms, eastern tent caterpillar, fall webworms, Japanese beetles, leaf tiers, mealybugs, mimosa webworms, woolly apple aphid, woolly beech aphid.
propargite	Ornamite	Uniroyal	spider mites.
soap	Insecticidal	Safer, Inc.	asphids, adelgids, balsam woolly aphid, Cooley spruce gall aphid, mealybugs pine needle scale, psyllids, sawflies, spider mites, spruce spider mite, spruce woolly aphid, whiteflies.
trichlorfon	Dylox, Proxol	Mobay, Nor-Am	bagworms, leafminers, lygus bugs, stink bugs, webworms.

SOURCE: *Drs. Baker and Nielsen*

(up to a month earlier in the South).

Crawlers and settled nymphs are susceptible to many scalicides, including Sevin, Orthene, diazinon, Dursban, Turcam/Dycarb, and synthetic pyrethroids in early July. A single, thorough-coverage, hydraulic spray should provide excellent control.

Scale vulnerability

Settled first nymphs and other nymphal stages of soft scales are vulnerable to contact insecticides because they are not protected by cast skins and wax. Sprays to control soft scales should always be applied after all eggs have hatched to minimize the impact of pesticides on lady beetles and other predatory insects, to minimize insecticide usage and to maximize control.

Second generation pine needle scale, euonymus scale, and white peach scale crawlers hatch during early July through the first of August. Two sprays at a 10 to 14 day interval may be required to control pine needle scale and white peach scale because crawlers hatch over a two to three week period.

Summer generation of euonymus scale crawlers hatch over an even longer period, so three applications at 10-day intervals are required for adequate control.

Aphid infestations should be controlled before they are abundant enough to produce copious amounts of honeydew or do irreversible damage to leaves. If aphids are allowed to build up in high numbers, plant growth may be distorted and leaves may fall prematurely.

Once honeydew and sooty mold are present they may persist long after aphids have been controlled by pesticides or natural enemies. Also, honeydew attracts yellowjackets and other stinging wasps, creating an additional nuisance.

Most kinds of aphids are vulnerable to contact sprays whenever they are active.

Spider mites can be controlled whenever they are active by spraying twice at a 5-day (South) or 10-day (North) interval. If trees are receiving repeated applications of Sevin to control other insects, be especially watchful for mite buildup.

Control of mites

Sevin selectively kills natural enemies of mites, thereby contributing to increases in spider mite population density.

Woody plants like some euonymus varieties and roses are frequently infested by two-spotted spider mites and tumid mites. These pests are dispersed on air currents and may appear suddenly in large numbers during hot, dry weather. When detected in potentially damaging numbers, they should be controlled as previously mentioned.

The second and third applications to control black vine **weevil** adults should be made in July and August. In the South, Japanese weevil and Fuller rose beetle can be controlled with Orthene as a spray and drench in July. A single spring application will not control black vine weevil or other weevils that attack landscape plants.

The injection option

White barked birches infested with bronze birch **borer** can be controlled during the summer by injecting trees with Inject-A-Cide B (Bidrin) using microinjection technology developed by the J.J. Mauget Co. Installation must be done by an experienced professional.

This is an extremely effective stopgap measure that can be used to save infested birches that are diagnosed as infested after it is too late to begin bark/foliage sprays in spring. Infested birches should be watered thoroughly and weekly during summer and fall droughts and fertilized in the fall after the first hard frost. The following year, bark/foliage sprays should be used as indicated earlier.

Injection should not be used annually on a preventive basis.

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The peachtree borer (a clearwing moth) can be controlled with a single application of Dursban or lindane in late June (in the North) or late August (in the South). The second application of Dursban or lindane for control of lesser peachtree borer (also a clearwing moth) can also be made at this time to protect infested ornamental flowering fruit trees.

FALL

(September-October)

The **defoliators** Mimosa and fall webworms reach their highest population density and cause most defoliation during late summer and early fall. They should be controlled as soon as first generation larval webs are detected in early summer. However, both pests are still susceptible to larvicides in late August and early September. If Bt is to be used, it must be applied when the caterpillars are small to achieve desired results.

Magnolia and tulip tree **scale** crawlers are produced in late August and early September. Infested trees should be sprayed when goldenrod is in full bloom (early September). A single, thorough-coverage, hydraulic spray with one of the aforementioned scalicides will provide excellent control. Both magnolias and tulip trees can be severely stunted or even killed by heavy infestations of these pests.

Galls on spruce turn brown and open in August and September. After galls open, adelgids are vulnerable to contact insecticides. Adelgids on spruce, Douglas fir, and pine remain

Using pesticides judiciously is top priority

We all share the responsibility to manage pesticide use more wisely. We can do that by following these steps:

- **Use insecticidal sprays** only after determining that a pest species is present at a density that will cause plant damage if the infestation is ignored and the pest is in a stage vulnerable to pesticide treatment.
- **Treat only infested plants** in the landscape rather than spraying all woody plants on the property. This is a biologically and financially rational approach, because most kinds of plants are resistant to most insect or mite pests.
- **Make the effort to** continually inspect your properties for pest problems. By doing so it's more likely that only a small part of a plant or a single plant will be infested when the pest's presence is first detected.

As more tree care specialists begin to adopt this process of landscape management and pest control, use of pesticides for managing our precious urban and community tree populations will be reduced, pest control will become more effective, the acquisition of resistance to insecticides by pests will be lowered and beneficial insects and mites can assume a larger role in maintaining pest species below damaging levels. □

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Duosan® broad-spectrum fungicide combines both contact and systemic ingredients to kill and prevent a wide range of diseases on turf, trees, shrubs, and flowers.

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Dollar Spot	Fusarium Patch
Anthracnose	Leaf Spots
Brown Patch	Red Thread
Copper Spot	Rust

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The peachtree borer (a clearwing moth) can be controlled with a single application of Dursban or lindane in late June (in the North) or late August (in the South).

vulnerable to insecticidal sprays until the following spring when new buds open.

Attempts to control **root weevil** larvae should be made in early September or October. A single drench with Turcam/Dycarb should be effective against larvae established in soil surrounding roots of field plants. Turcam/Dycarb, Orthene, or Furadan 4F can be used to control larvae established in containers, using one pint of solution per gallon of container volume.

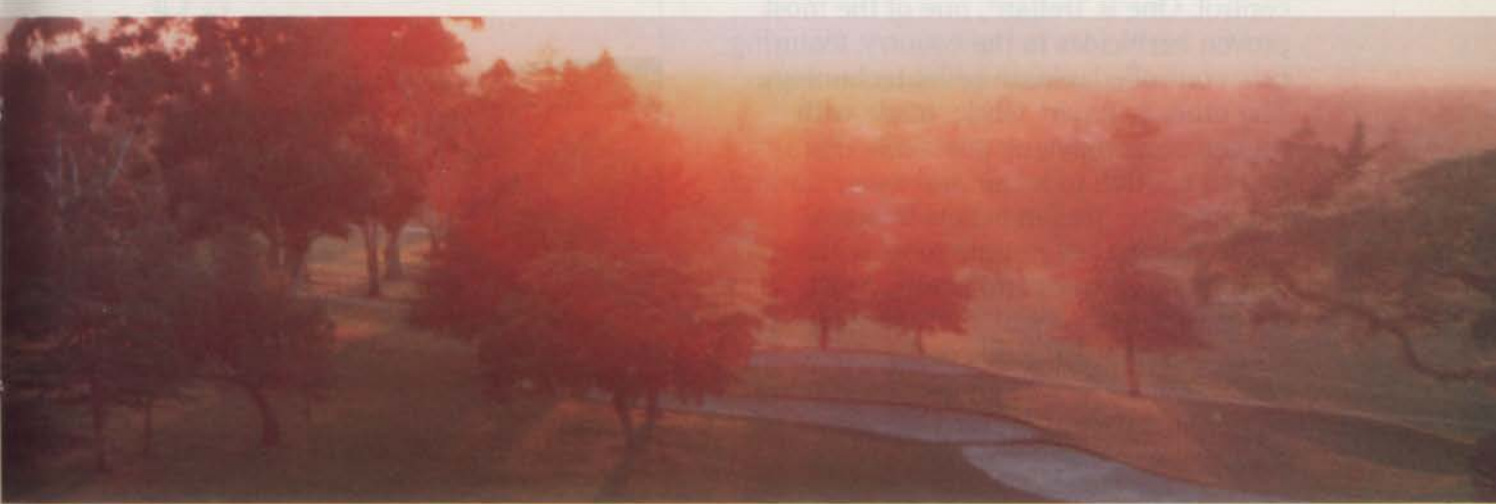
Maintenance important

The best way to minimize insect damage is to maintain healthy trees and shrubs. Trees should be planted at sites where they can be expected to survive and thrive, and they should be watered during the first year after planting and subsequently whenever soil moisture becomes low. Proper pruning, fertilization, mulching, and aerification will promote plant vitality, helping trees and shrubs to help themselves against opportunistic pests.

When a pest is detected on a valuable landscape plant, it must be properly identified, its vulnerable stage(s) determined, control practices learned and a determination if direct control measures are warranted. If intervention is justified, the pest should be controlled with minimal impact on non-target organisms.

Remember, coverage and timing are often more important than the pesticide chosen for an insect or mite control program. In all cases, read the label on the pesticide container and follow all instructions to make sure you comply with the law.

Rational pesticide use does not constitute a threat to the quality of our urban environment. Informed landscape managers can use a combination of horticultural practices and pesticidal treatments to enhance the vitality and quality of our urban and community forests. **LM**



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either ingredient separately.

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the ugly side of you

Introducing Typar® Biobarrier™ root control system.

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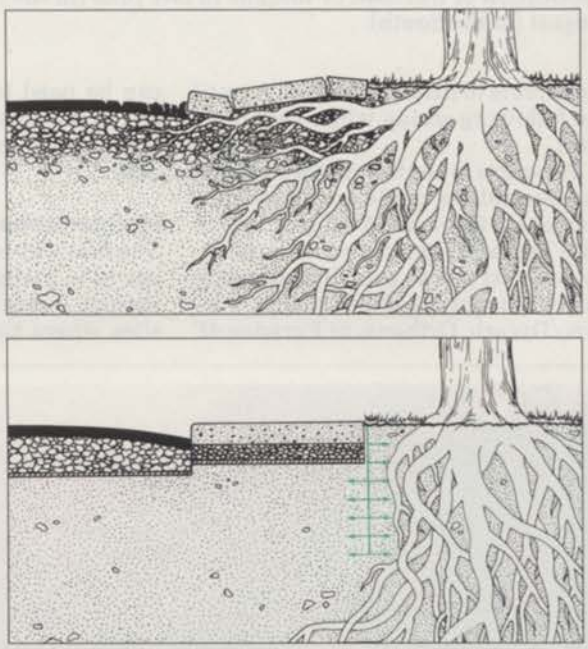
Biobarrier combines two of the most effective, longest-lasting elements in root control. One is Treflan®, one of the most proven herbicides in the country, featuring new controlled-release pellet technology. The other is Typar® fabric, made with rugged polypropylene geotextile that's porous enough to let air and water through but holds the Treflan pellets in place.

Together, they reroute roots without harming your trees and plants. And preserve the beauty of your landscaped areas — golf greens, cart paths, sidewalks, curbs, walkways, parking lots, swimming pools, gardens and others — for years to come.

For 15 years or more.

Underground, Biobarrier sets up a solid rootproof zone that spans one to two inches on each side of the fabric. That's the Treflan controlled-release vapor zone. A zone so powerful, it repels roots at a controlled rate for 15 years or longer.



Top Without Biobarrier, tree roots penetrate paved surface and aggregate base, causing unsightly cracking and heaving.

Bottom With Biobarrier, a protective zone of Treflan vapor reroutes roots downward without harming roots or tree.

For half the cost or less.

By rerouting roots downward, Biobarrier protects your golf greens, cart paths, tennis courts, swimming pools and other recreational areas from unsightly roots. And helps keep your reputation in good standing among your customers.

tame
ur landscape.

The cost savings are just as dramatic. Over 50%, in fact, during Biobarrier's lifespan.

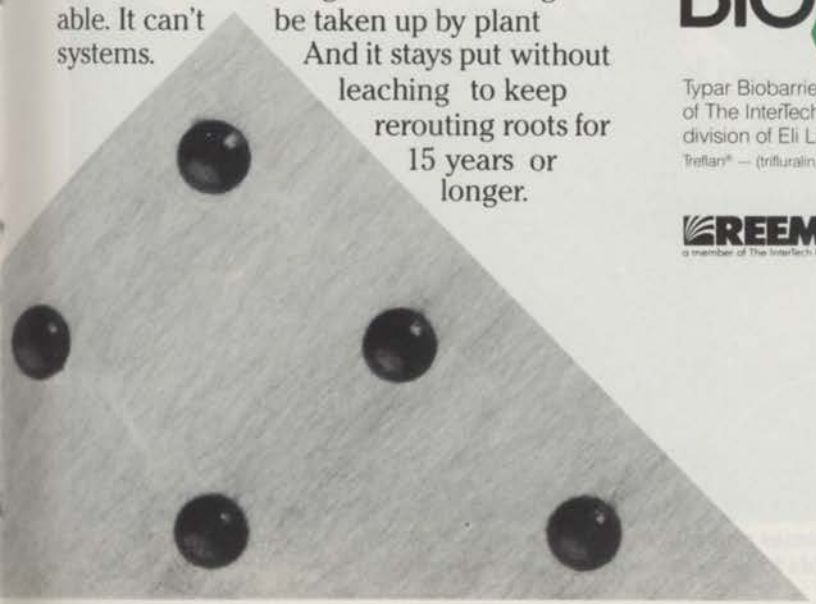
Without Biobarrier, you're spending plenty to trench, trim roots and replace damaged landscaping. And it has to be redone often to protect greens, cart paths and other landscaping.

But with Biobarrier, you'll only do the job once every 15 years — trim roots, replace damaged cart paths and install Biobarrier.

Easy on plants and landscaping.

Unlike other root control methods, Biobarrier won't harm trees or nearby landscaping. It doesn't kill roots, it just reroutes them away from your golf, recreational or landscaped areas.

Treflan's active ingredient is biodegradable. It can't be taken up by plant systems. And it stays put without leaching to keep rerouting roots for 15 years or longer.



Easy to install.

The Typar fabric in Biobarrier is flexible to make installation simple. Just install vertically along your golf, recreational or landscaped areas where tree roots threaten to bring out the ugly side of your landscape.

Call toll-free.

For the complete story on Biobarrier, see your Elanco representative. Or send for a free technical brochure from Elanco Products Company, Lilly Corporate Center, Dept. EM-455, Indianapolis, IN 46285, U.S.A. Or call toll-free: **1-800-352-6776.**

TYPAR® Biobarrier™ Root Control System

Typar Biobarrier is jointly marketed by Reemay, Inc., a member of The InterTech Group, Inc., and Elanco Products Company, a division of Eli Lilly and Company.

Treflan® — (trifluralin, Elanco)

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ELANCO

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Dodgertown Golf Club, the first public course in Florida's Indian River County, opened in 1965.

THE DODGERS' OTHER MANAGER

If there are calamondins in center field, we must be in Dodgertown.

by Will Perry, managing editor

With a sharp crack of the wood, a baseball is sent tearing through soft Bermudagrass in search of safety in center field. Instead, it will be swallowed in the webbing of Los Angeles Dodgers' shortstop Alfredo Griffin's glove. Moving quickly to his left, Griffin backhands the ball as it hops off the red clay infield and releases a waist-high strike to the first baseman, nicking a few points off the pre-season batting average of a disappointed Oriole.

Twelve thousand sun-tanned hands clap their appreciation of Griffin's defense while Dodger manager Tommy Lasorda looks on without registering emotion. Six rows behind him, Carol Thomas does the same. Neither has reason to get their dander stirred, for everything had gone according to plan.

"When I'm at these games I'm especially attuned to hits like that. I watch closely to make sure it takes a good, natural bounce—no surprises," says Thomas.

For the past three seasons Thomas has been sports complex superinten-

Carol Thomas and Ron Cummins use their combined knowledge of turf and infields to keep the fields at Dodgertown looking good.

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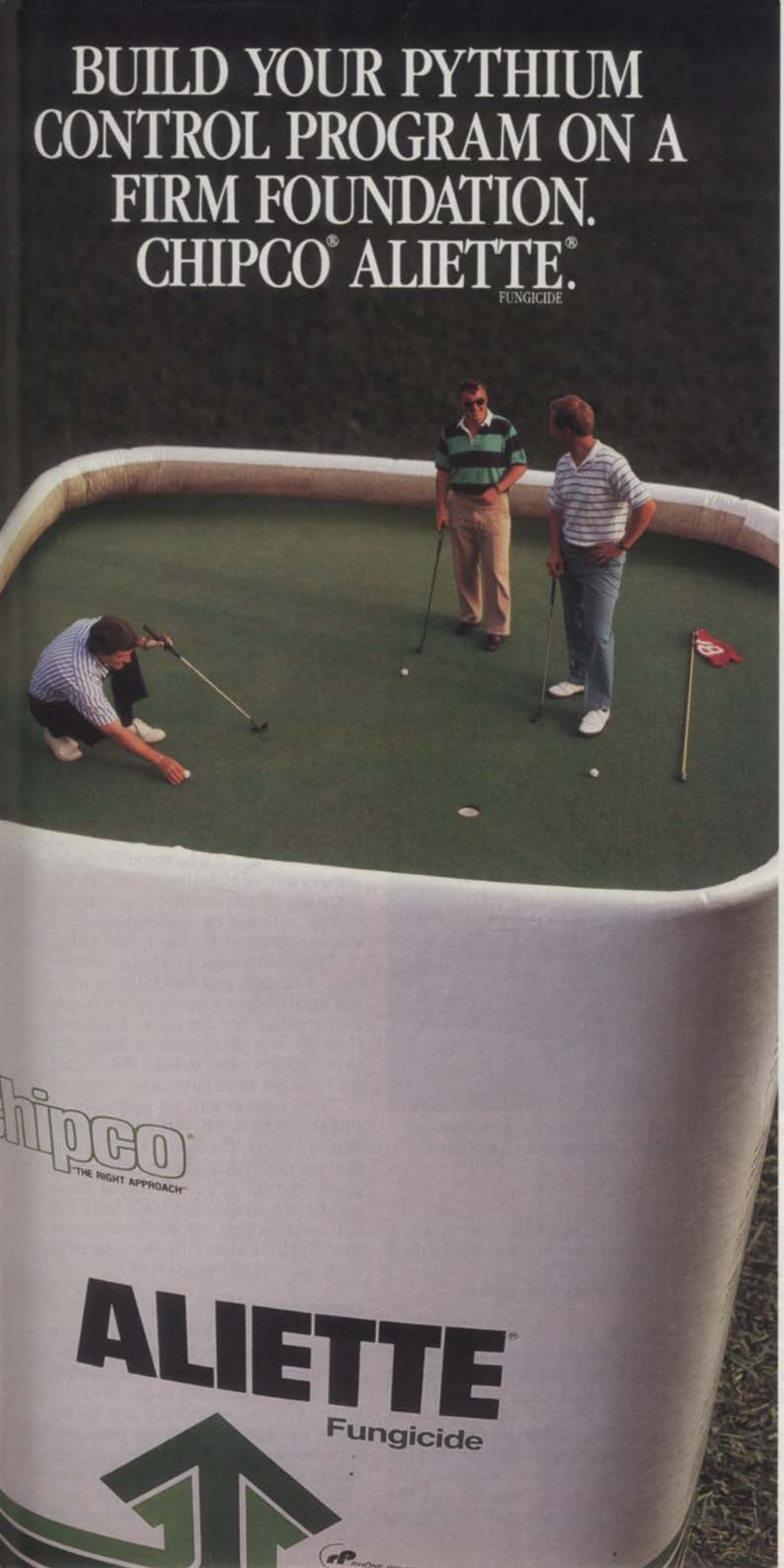

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The Los Angeles Dodgers play 14 games in Dodgertown in March. Then, the Vero Beach Dodgers begin their 140-game Class A schedule.

Superintendent Thomas encourages wildlife at the Dodgertown courses—a practice appreciated by this fox squirrel, which is dining near a practice green.

dent here in Vero Beach, Fla., spring home of the Dodgers. This is her second season grooming Holman Stadium, one the five baseball fields used by the team in spring training and by its sister team, the Vero Beach Dodgers, in the Class A Florida State League the rest of the summer. She also manages the rest of the 450-acre Dodgertown landscape:

- Dodger Pines Country Club and Dodgertown Golf Club (18- and 9-hole golf courses, respectively;
- a 23,000-square foot administration building;
- a 90-villa residential complex;
- numerous office and equipment buildings; and
- 70 acres of citrus groves.

A huge job

It is, by all measures, a huge job: she balances 55 employees; tries to keep the often inflated egos of professional sportsmen at bay; remains responsive to club members; battles fierce mole cricket infestations; and provides the first class landscape one would expect of a high-profile organization like the Dodgers. It is also, by all measures, performed admirably.

Thomas, 36, is a strong-willed, hands-on manager who knows people as well as she knows turf. She is a lifelong sports enthusiast yet she stops well short of the hero worshiping that goes on every day along the foul lines at the stadium.

She loves animals and usually brings her black cat Sprint to work with her (she leaves her two parrots and dog at home). She is an adamant environmentalist who defends the judicious use of chemicals. Though demanding of her employees, Thomas carries with her an even temper and a sincere concern for their well being.

Thomas is modest about Dodgertown's success and will tell you without hesitation it's her people who are responsible for its look. Half-way through her third season here, she says she has now got the fine-tuned staff she needs to get the job done.

"You cannot run an operation of this magnitude without good support people," says Thomas. "I really feel that people in this labor market aren't given enough credit. Without these people we simply couldn't have the golf courses that we do. I encourage them to think about the importance of their job and of themselves."

Using retirees

She can't say enough good things about the benefits of employing retired people, or "little encyclopedias with legs," as she calls them. She finds retirees more dependable and harder working than the average teenager. She is constantly amazed by the things they've learned over the years. "It's neat because these people have done so many things and learned so

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A brief history of Dodgertown

Dodgertown's 450 acres were formerly an abandoned naval air station. Forty-one years since it was purchased by the Dodger organization, it has grown into one of the country's superb sports facilities.

1839. Abner Doubleday lays out the first diamond-shaped field with four bases, 60 feet apart, at Cooperstown, N.Y.

1845. Alexander J. Cartwright designs the game of baseball and establishes standard rules. He also organized the first team, the New York Knickerbockers.

1869. The Cincinnati Red Stockings, the first all-professional team, is established. Players earn from $600 to $1,000 a season.

1871. On May 4, Ft. Wayne defeats Forest City of Cleveland 2-0, winning the first all-professional game ever played.

1876. The National League is formed.

1900. The American League is formed but rejected by the National League. Disputes about players defecting to the new league lead to its eventual acceptance.

Around 1900. An eight-team league is formed in the National League. Its members include the Boston Braves, Brooklyn Dodgers, Chicago Cubs, Cincinnati Reds, New York Giants, Philadelphia Phillies, Pittsburgh Pirates and the St. Louis Cardinals.

1948. Eastern Airlines flight and station manager Bud Holman sells the Brooklyn Dodgers on the idea of training in Vero Beach, a sleepy, coastal Florida town of 3,000 residents.

1953. Holman Stadium opens.

1965. Walter O'Malley, president of the Dodgers, purchases 110 acres of land from the city of Vero Beach and opens Indian River County's first public golf course, Dodgertown Golf Club.

1972. O'Malley purchases another 220 acres, which become Dodger Pines Country Club. Its No. 3 hole, at 660 yards, is one of the few par 6s in the country.

1972-1976. Dodgertown undergoes major renovation. Old barracks are torn down and replaced with modern housing units. An administration building containing dining room, kitchen, canteen, lounge, movie theatre, locker and equipment rooms, medical department, dark room and recording studio is built. An Olympic-size swimming pool, four lighted tennis courts, a basketball court and shuffleboard courts complete the scene.

1977. Harrison Conference Services of Glen Cove, N.Y., is brought in to conduct business meetings and seminars at Dodgertown throughout the year.

Today. Football, too, has a place here. Dodgertown was the New Orleans Saints training camp from 1974 to 1984 and has hosted the Green Bay Packers, New England Patriots, Cleveland Browns, Buffalo Bills, Miami Dolphins and Tampa Bay Buccaneers in recent years.

The Dodgers have won championships in 1949, '52, '53, '55, '56, '59 (World Series), '63 (World Series), '65 (World Series), '66, '74, '77, '78, '81 (World Series), '83 (World Series), '85 (World Series), and '88 (World Series). Dodgertown now employs 240 people.

—*Will Perry*□

much over the course of their lives. The biggest part of my job and the reason I'm successful at it is not because I know everything but I know how to find things. With these people around, I have great sources of information on almost any subject."

Referred to by one employee as a perfectionist, Thomas is not at all intimidated by the challenges of managing Dodgertown or by being a woman in a traditionally male sport and field. It's a scenario she's used to, she says, thanks to her father, who demanded the most of her at all times. There weren't too many other women studying microbiology at Orlando's University of Central Florida either, or earning graduate degrees in microbiology at North Carolina State in the mid 1970s. Being a minority has made her work even harder.

Up with the sun

Thomas begins her 12- to 14-hour day by coordinating all the notes she has scribbled to herself at work the previous day. This list of instructions and suggestions will move down the hierarchy of employees via several chalkboards in equipment and maintenance facilities throughout the complex. It's indicative of Thomas's philosophy of preventative instead of curative management.

The well-groomed nature of Dodgertown reflects Thomas's foresight. "Before she got here this place was a real mess," says an employee in his sixth season here. "You wouldn't have believed professional sports teams played here. Carol has really got it together."

Her days are pretty evenly divided between the baseball complex and the golf courses, until the Dodgers arrive in late February. At that time it's important that the field conditions befit what one would expect for the world champions.

"You're talking about me providing a safe place for the $7.9 million man (pitcher Orel Hershiser). If this guy brings to my attention something that he thinks is a problem that potentially could shorten his career, then it's worth looking into," says Thomas. "I can't afford to have even a paltry $2.5 million player have a problem on my fields."

Thomas's expertise in turf is complemented by Ron Cummins' knowledge of clay infields to provide the quality playing conditions at Dodgertown's ball fields. Thomas says there are no management practices used here that would differ much from any other facility. Still, because Holman Stadium is so old, there is no underground drainage system, no home

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plate-to-center field grade and an irrigation system consisting of "a few Toros, some Rain Bird and other stuff."

"This is a very, very old system here, much like what I have on the golf courses. A lot of it has been piecemealed together," says Thomas. "We've tried to make some alterations but not nearly what we need." A new sprinkler system is on tap for the stadium, though it may get bumped if field expansion plans are implemented next year.

Thomas began covering the mound and home plate area every night, thereby preventing the rain from washing the clay into the turf and eventually choking it off. Stripping and renovating those areas was "a major undertaking" according to Thomas, and it has since been added to her to-be-avoided list. Around the infield, clay is swept or hosed back into the base paths as necessary.

The mound is built with a dense clay packed very hard to absorb the pressure exerted on it by pitchers. "It's a lengthy process of packing, packing and more packing. You want to avoid a layering effect, which will allow it to peel off in pieces over the course of a game. That happens when you use more than one substance to build it," says Thomas.

The mound height is maintained at 14 inches. The Bermudagrass infield is cut at 1/2 of an inch, the outfield at 5/8 inch.

Unless they interfere with play or grow so low that they get in the way of mowing equipment, trees on the course are left alone. As a result, problems with the trees are non-existent.

For the first time this year at a slight increase in cost, the post-game cleanup work has been contracted to an outside firm. The expense is well worth the reduced aggravation involved, according to Thomas.

From bats to clubs

Dodgertown Golf Club is a nine-hole, par 35, semi-private course just up the street from Dodger Pines Country Club, an 18-hole, semi-private, par 73 course that neighbors the baseball complex. Like many places in Vero Beach, the golf courses too are dripping with Dodger folklore.

According to Thomas, former Dodgers' president Walter O'Malley and his players were often seen teeing off at nearby clubs when the team was in town.

"Everything was going well until the Dodgers started to bring in the first black players. In the old South like this, especially at the country clubs, black people were not allowed to play golf. So Walter said, 'I'm going to fix you guys,' and he built the nine-hole course." It became so popular, Dodger Pines was opened seven years later, in 1972.

Both courses enjoy an abundance of Floridian vegetation, challenging water hazards and smooth Bermudagrass fairways. Thomas uses a combination of Tifway 419 Bermudagrass and bahiagrass in the roughs and Tifway 328 on the greens. In the winter the greens are overseeded with ryegrass.

From the Dodger Pines clubhouse you can watch golfers at work on seven different holes. The first, third, fourth, sixth, seventh, ninth and tenth

EASY COME.

Top row: *Leaf-feeding caterpillar, Mealy bug, Japanese beetle, Bagworm, Gypsy moth.* Bottom row: *Cankerworm, Leaf skeletonizer, Tent caterpillar, Webworm.*

holes have either a green or tee that abuts the facility.

The courses absorb 250 to 300 rounds a day. That means compaction and cup placement problems, which are compounded by the fact that the tees and greens are on the small side. To reduce compaction, a lot more hand aerifying at the end of cart paths and on tees is taking place. The goosegrass that inevitably grows in these areas is handled with MSMA.

On greens the cups are moved every other day and a color-coded flag system is used to alert players if the cup is at the front, middle or rear of a green.

Thomas prefers granular fertilizer applications, supplemented with liquids for quick green-up, at both golf courses and at the baseball fields.

Slow-release fertilizers are also used here. In the spring and summer it's sulfur-coated and some methylene-urea products. "In late fall we use IBDU because I feel that with the temperatures here I still get some nitrogen release without having to worry about microbial activity," she says. Weak areas, such as cart paths, tee slopes and other sites that endure heavy traffic, will be fertilized even more often. Tees and greens are fertilized on a monthly basis ranging from ½ to 1 lb./N/sq.ft.

"I like using fertilizer rates that are high in potassium because potassium provides so much hardiness and drought tolerance. We have plenty of natural phosphorus in this part of Florida," adds Thomas.

Carol Thomas is not at all intimidated by the challenges of managing Dodgertown or by being a woman in traditionally male sport and field.

The biggest problem

Mole crickets "are by far and away the worst problem here," says Thomas, adding that infestations are worse every year. The scope of the problem limits the preventive measures she can take that will be effective. Oftanol is her primary weapon. An application is made in spring as soon as juveniles emerge from the eggs, usually in early May. After that, spot treatment with Orthene is used on an "as needed" basis.

Another significant problem that many superintendents face, says Thomas, is the franchising network that often makes it difficult to receive the prompt equipment service often necessary in this business. "Equipment-wise there are a lot of really well made things out there. But you can't buy just a piece of equipment any more. I'm actually looking at my second or third choices in equipment because I have to be able to get the service I need from the franchisor."

The pines

The many trees that line the courses are primarily laurel oak, Florida slash pine and sable palms. Unless they interfere with play or grow so low that they get in the way of mowing equipment, they're left alone. As a result, insect and disease problems in trees are almost non-existent. Lightning remains their cardinal nemesis.

Another delightful aspect of the courses is the abundance of wildlife. *continued on page 69*

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DODGERS *from page 67*

Several fox squirrels appeared mysteriously recently. They are joined by otters, soft-shelled turtles, numerous varieties of birds, a family of three alligators and a 5½-foot-long land-locked tarpon that has been on the course for eight years.

"I have a real hands-off policy about killing anything," says Thomas in a tone that leaves little room for interpretation. "I'm real particular about it."

On this morning, she brought to work with her the scraps of an apple pie she prepared the night before—a treat for the squirrels.

"I leave a lot of natural vegetation in my waterways. I won't bottom-clear," adds Thomas. "At my membership meetings, that will invariably come up. They want me to dredge and chemically clean out all the vegetation and replace it with sand so that people will have an easier time finding their golf balls. I tell them I won't do it. I ask them, 'Have you ever seen the otters...the bass...all the wading birds?"

Because Holman Stadium is so old, there is no underground drainage system, no home plate-to-center field grade and an irrigation system consisting of 'a few Toros, some Rain Bird and other stuff.'

Twelve hours after her day began Carol Thomas is sitting on the St. Augustinegrass that covers the ridge spanning the outfield fence at Holman Stadium. The game is over; busses move into place to transport players; fans head for the parking lots and the final foursomes beat into the clubhouse before the sun sets. A disgruntled Coach Lasorda decides his defeated team could stand a little more practice before calling it a day. Carol Thomas, walkie-talkie in tow, directs her crew to drag out and set up the batting cage.

The Dodgers' other manager's day isn't over yet. **LM**

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WEATHERING A CHAMPIONSHIP

What do you do if a massive thunderstorm pummels your course in the middle of a PGA tournament? Hope Dick Schulz is on your side.

No one can convince superintendent Dick Schulz that working at Atlanta Country Club is a 24-hour-a-day job. Maybe 22 or 23. But never 24.

That's what happens when you're in the middle of the Atlanta Classic, a PGA Tour event, and a Texas-sized thunderstorm does its best to wash away your course overnight. You also find out what your staff thinks of you.

The storm was an interesting tribute to the 20th anniversary tournament, June 20-26, 1988. The deluge started at around 9:30 Saturday night. "An inch-and-a-third of rain and hail in nine minutes," Schulz recalls, shaking his head. "You couldn't see 10 feet in front of you. The wind blew about 60 miles an hour." The casualties: seven trees down, six more hit by lightning; tents, tables and umbrellas blown all over the countryside; two copiers tossed 20 feet into a pond; 63 bunkers washed out; trash everywhere.

"It was incredible," Schulz remembers. "We figured out we moved between 500 and 600 tons of sand in the bunkers that night trying to dry them out."

Sounding the call

Two of Schulz's assistants—Cory Hopke and Scott McDaniel—along with two turf students living and working at the course, were there when the storm hit. Schulz and the rest of the staff—10 full-time and three part-time people—had gone home.

Schulz had been cooking out with houseguests. When the storm hit, his brother (one of the guests) got on the phone and started calling crew members. He reached all but two part-timers. "Some of the people had already made it back in before my brother called. They knew the storm had hit. We worked through the night."

They broke for some sleep around 3 a.m., but not much. They started up again at 4:30, joined by the Atlanta Classic Foundation President Jim Abney, past president J.L. Jerdin and president-elect Leo Corely.

"They got some volunteers together and started picking up the trash," Schulz says. "We worked on turf areas and the sandtraps. We cut up a bunch of trees, blew trash off the greens. We worked our way around the course in order, finishing at around 9:30 a.m.

"I wasn't sure we'd play Sunday because I had never experienced that kind of storm during a tournament. We stayed ahead of the golfers and we didn't have to delay the start-up at all."

Atlanta Country Club superintendent Dick Schulz recalls repairing his course overnight in the middle of a PGA tour event. "It was incredible," he says. "We figured we moved between 500 and 600 tons of sand in the bunkers that night trying to dry them out."

Touring pro Larry Nelson, a club member, spent a couple of minutes in front of the CBS cameras talking about what a great job the staff did.

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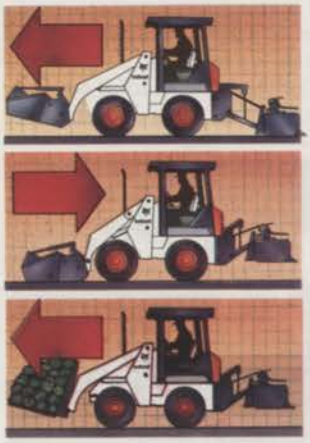

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The staff received much recognition for the job it did on the course that night.

Plug on CBS

"Touring pro Larry Nelson, a club member, got out on the 18th green after the tournament ended Sunday and spent a couple of minutes in front of the CBS-TV cameras talking about what the staff did; and the newspapers—it was incredible!" Schulz recalls proudly. "My assistants worked a 24-hour shift with that hour-and-a-half sleep."

This was Schulz's fifth Atlanta Classic. (The sixth runs May 22-28.) The first four were somewhat less eventful. "The tournament is probably the most fun week of the year. It's tough," he understates. "There's a lot of hours, but it's fun because we worry about the golf course only.

"It's pure turf management and personnel management and it's exciting. We get to see the players and we have more exposure each year through CBS and the media. Some of the players even stop by and say 'hello.' It makes the staff and the crew feel good."

In calmer times, the job is a bit easier. Schulz and his staff only have to deal with things like drought, a fairway irrigation system in the process of renovation and other little annoyances like a climate conducive to turf diseases. New wells will help ease future drought conditions and the membership approved a $125,000 program to improve the irrigation system.

Fusarium fighter

Schulz keeps the summer diseases—mainly fusarium, which has plagued the course through its 25-year history—at bay with a rotation of preventive fungicide applications anchored by a one- to two-ounce spring application of Mobay's Bayleton.

"Bayleton is very strong on fusarium," Schulz comments. "From a cost-per-ounce-applied and results standpoint, it's superior."

"We've come up with a program that functions extremely well. We have not had disease problems since I came here in February, 1984," Schulz says.

'It was incredible. We figured we moved between 500 and 600 tons of sand in the bunkers that night trying to dry them out.'

—Dick Schulz

This all serves to make the crew's job a little easier, and Schulz's job a little more secure. He has the support of his members, reflected in their willingness to increase pay to bring in better people. He has a lot of confidence in his staff, which includes three assistants—Hopke, McDaniel and irrigation specialist John Miller—and a mechanic.

"I'm either going to look good or bad depending on the type of staff I have," Schulz believes. "It's a people business."

Schulz has a history of working with good people though he's only 33, but it's a bit of a problem. "Whenever you have a really good staff they move on." To date, 14 of his former assistants are now superintendents. Still, it's a good problem to have. **LM**

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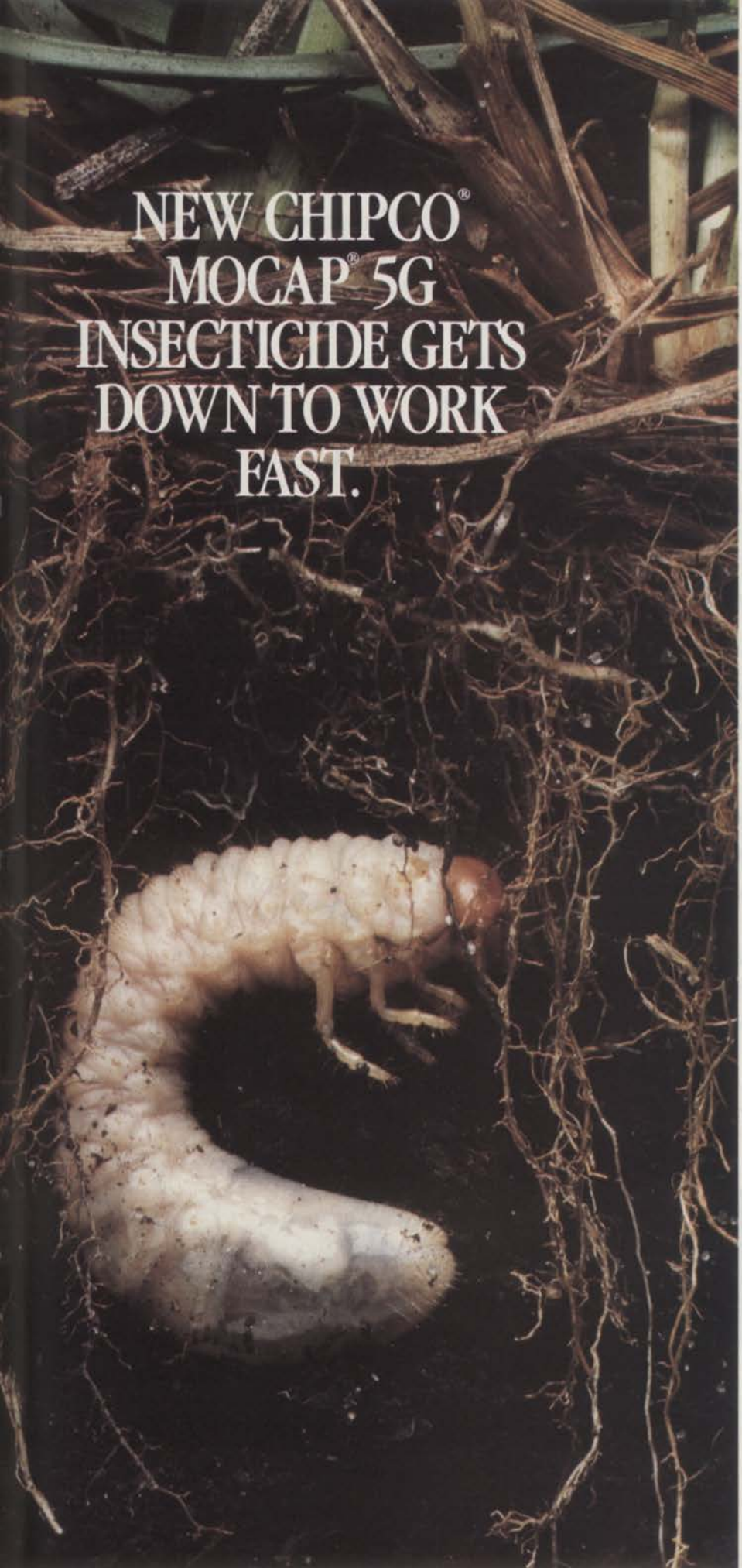

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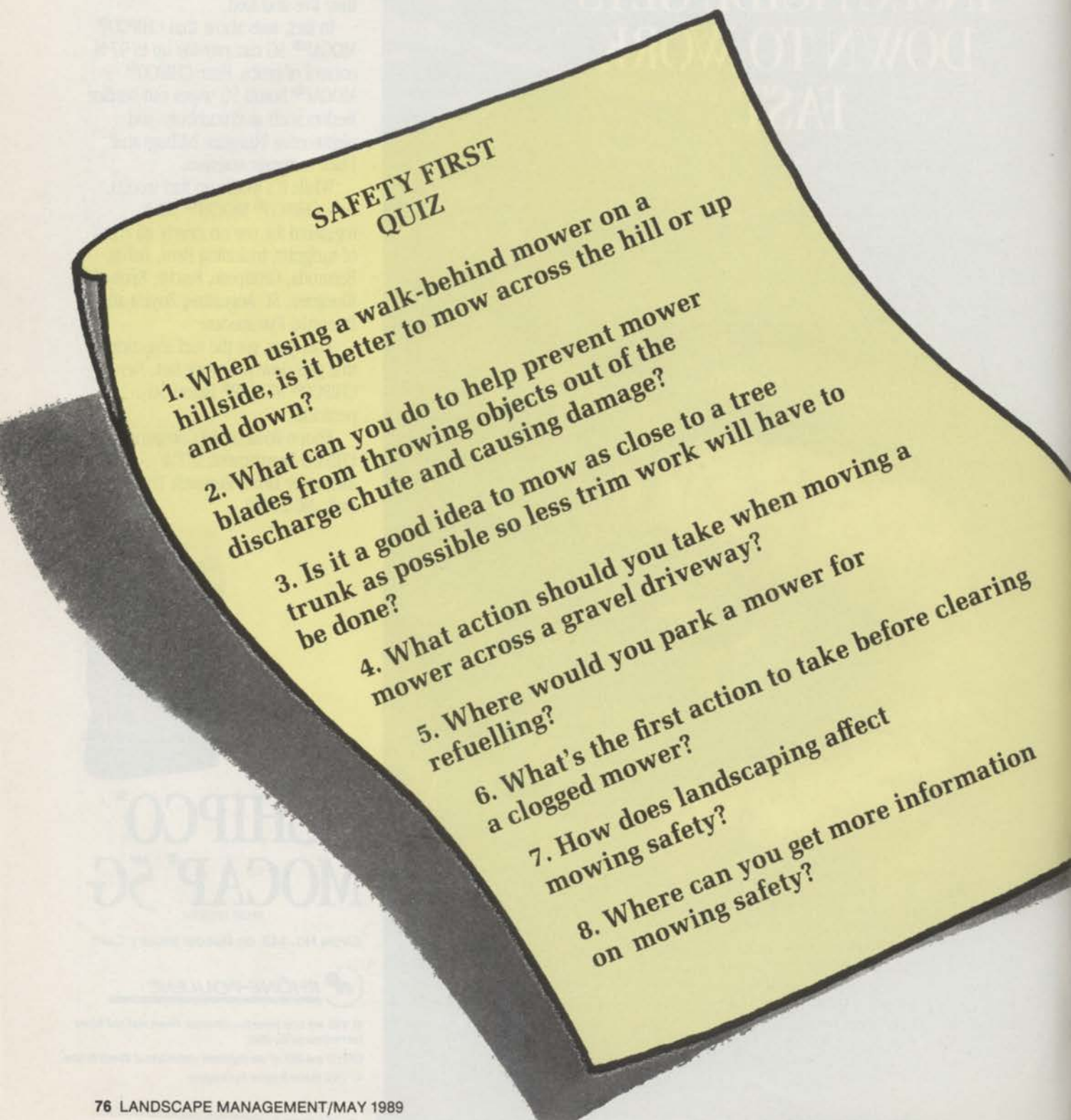
MONITORING MOWING

We have a fair idea of how many people in the green industry operate lawn mowers. But how many operate them carefully? Here's a mowing safety quiz that will help you and your people determine how safety-conscious you are.


SAFETY FIRST
QUIZ
1. When using a walk-behind mower on a hillside, is it better to mow across the hill or up and down?
2. What can you do to help prevent mower blades from throwing objects out of the discharge chute and causing damage?
3. Is it a good idea to mow as close to a tree trunk as possible so less trim work will have to be done?
4. What action should you take when moving a mower across a gravel driveway?
5. Where would you park a mower for refuelling?
6. What's the first action to take before clearing a clogged mower?
7. How does landscaping affect mowing safety?
8. Where can you get more information on mowing safety?

Riding mowers are more stable going up and down slopes.

Here are the answers

1. It's recommended you mow *across* hillsides with a walk-behind mower so that you're less likely to fall on the tumbling mower if you slip and fall. However, riding mowers are more stable going up and down slopes. Steep hillsides can be planted in a groundcover that never needs mowing.

2. Before starting the mower, walk around the lawn to pick up debris—sticks, stones, dog bones, chain—anything that can be hurled by the mowing blades.

3. Avoid mowing close to trees. If you mow close to a tree trunk, you run several risks. First, you can scrape off bark and damage the tree. You can be scratched by lower branches. You can be thrown off-balance by lower branches. If possible, remove the grass around trees in a circle with a one- to three-foot radius, depending on the height of the tree. Fill the circle with a soft mulch like shredded bark. This makes it possible to trim more conveniently with the mower and helps protect the tree.

4. Before mowing across gravel, turn off the mower blades so they don't send out a hail storm of tiny stones.

5. A driveway is a good place to refuel because any spilled fuel can be wiped up conveniently without harming the lawn. If possible, when refuelling, wait for the engine to cool.

6. Before clearing a clog, you, of course, should make sure the cutting blades are turned off and not under power. Disconnect the spark plug wire on walk-behind mowers. Turn off the mower engagement switch on a riding mower. Never put your fingers under the mower deck if there's any possibility that the blades can turn under power. The blades move very close to the deck housing.

7. Landscaping touches can determine your mowing direction. Mowing forward provides better visibility and greater convenience. Mowing backward is a more awkward maneuver. If you have to go backward, look back before moving and keep looking all around. Move as short a distance as possible; try to move forward as soon as possible.

8. Mowing safety information is available from several sources. The operator's manual is one. Decals on the machine itself is another. Or, you can sometimes get safety information from the manufacturer itself from your dealer/distributor. Finally, a booklet titled "Safety Know—How" is available from John Deere & Co., Dept. 574, 1400 Third Avenue, Moline, IL 61265. The 12-page booklet for both landscape professionals and homeowners discusses the safe operation of mowers, tillers, snow blowers and chain saws. **LM**

MENDING A WOUNDED BIRD

From hell-in-a-handbasket to tournament shape...It's been a long road, but Quail Hollow Resort is now a top-notch facility.

Make no mistake. Work still needs to be done on Quail Hollow Resort. But it's a far cry from the work that needed to be done 10 years ago to this inn and 18-hole golf course near Painesville, Ohio.

The inn and course combination is only 13 years old. The course, designed by Robert Von Hagge and former touring pro Bruce Devlin, opened its first nine holes in August 1975, the second nine a year later. It went bad shortly thereafter.

It became a Ramada Inn franchise in November 1975. That lasted less than a year, when it was bought by Diamond Shamrock in October 1976.

"[Quail Hollow] probably would have closed without Diamond," says Jerry Mix, former director of public relations for the Diamond Shamrock Chemical Division.

Over the next five years, Mix notes, Diamond Shamrock "poured capital" into improving and remodeling the facilities. At the time, the company still had its world headquarters in Painesville. (It has since been moved to Dallas.) The company's intention was to turn Quail Hollow into a corporate training center. "It was an important resource to them," Mix says.

But Diamond intended to make it more than a training center. It wanted a resort. The key was a good marketing plan, something prior management hadn't had.

Diamond started by closing the golf course for major renovation in 1977. Irrigation systems, shelters, bunkers, improved path drainage nad new equipment got first priority. Maintenance and cart storage buildings were erected, and renovations to guest rooms, the kitchen and clubhouse were completed.

The resort began hosting golf outings and corporate meetings; the refurbished restaurant, the Quail

By September, 1985, Quail Hollow was in tournament condition. That year, it hosted the Ohio open, which it will do again this September.

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Superintendent Jim Loke believes in playing the course to inspect it. One of his additions has been dwarf Alberta spruce planted as 100-, 150- and 200-yard markers, here on the 13th.

Wagon, promoted dining and Sunday brunches.

More work

In 1982, Diamond brought in superintendent Jim Loke from Firestone Country Club.The first thing he did was to set his priorities.

"The greens were in such poor shape," he recalls. "They needed a lot of T.L.C."

Nine greens needed partial resodding because of bare spots. Where resodded, the substructure of the greens was rebuilt for better drainage. "If it was economically practical, we would have rebuilt all the greens. But it wasn't practical," Loke adds.

His second priority was to lower the cutting height "down to an acceptable level." His first stop was 1/8 of an inch, but that was too short for golf clients not used to fast greens. Loke now keeps it at 5/32.

He also found the soil mix in the greens to be too high in silt, about 12 or 13 percent. They were too firm. An aggressive ongoing aerifying program and sand/peat top dressing is relieving the compaction.

While this was going on, Diamond sold the resort to Club Corporation of America, a country club managing company, in September 1983. After moving its headquarters to Dallas and focusing primarily on oil and gas concerns, Diamond no longer needed the facility.

CCA bought Quail Hollow, the company's first venture at resort management, because Robert Dedman, the chairman and owner, "fell in love with the property," says Quail Hollow general manager Joseph Lucko. "He felt that, being in the country club business, getting into resorts was the natural way to go."

CCA, Lucko says, has maintained the improvement path that Diamond Shamrock set the facility on originally. Improvements to course drainage and bunkers continued and tree stumps were removed. In all, CCA pumped about $500,000 into the course, half of that for new equipment.

Another area of concern for Loke was soil chemistry, a need to reduce acidity with lime plus gypsum and supplement of sulphate, (a four-year program, Loke notes). The course was also too well shaded. Loke has had 500 trees removed. As a result, "we have grass growing where grass has never grown before," he says. "That was kind of the obvious stuff."

The irrigation system is still being renovated. It now has a Toro closed hydraulic system with Toro AT4 controllers. The pump house is being rebuilt, with flow meters added to control larger pumps and improve watering efficiency. He hopes to have the system completed this year.

Each hole now has 100-, 150- and 200-yard markers. In 1985, 10,000 feet of cart paths were asphalted. Unfortunately, because of the water properties of clay under the paths, the base was insufficient to keep the paths from cracking when the clay expanded and contracted as it moistened and dried. Plans call for the paths to be resurfaced this year, with a proper base. Loke notes that they are still trying to determine what the proper base will be.

Needless to say, the course has taken a lot of work. Loke credits assistant, Dan Nagy, a 25-year-old Ohio State graduate who has worked at Quail Hollow for seven years, with excellent help.

He has the course now where "over several months, we are able to get the course in tournament shape." Which is a far cry from where it was 10 years ago, when it was several months away from playable. **LM**

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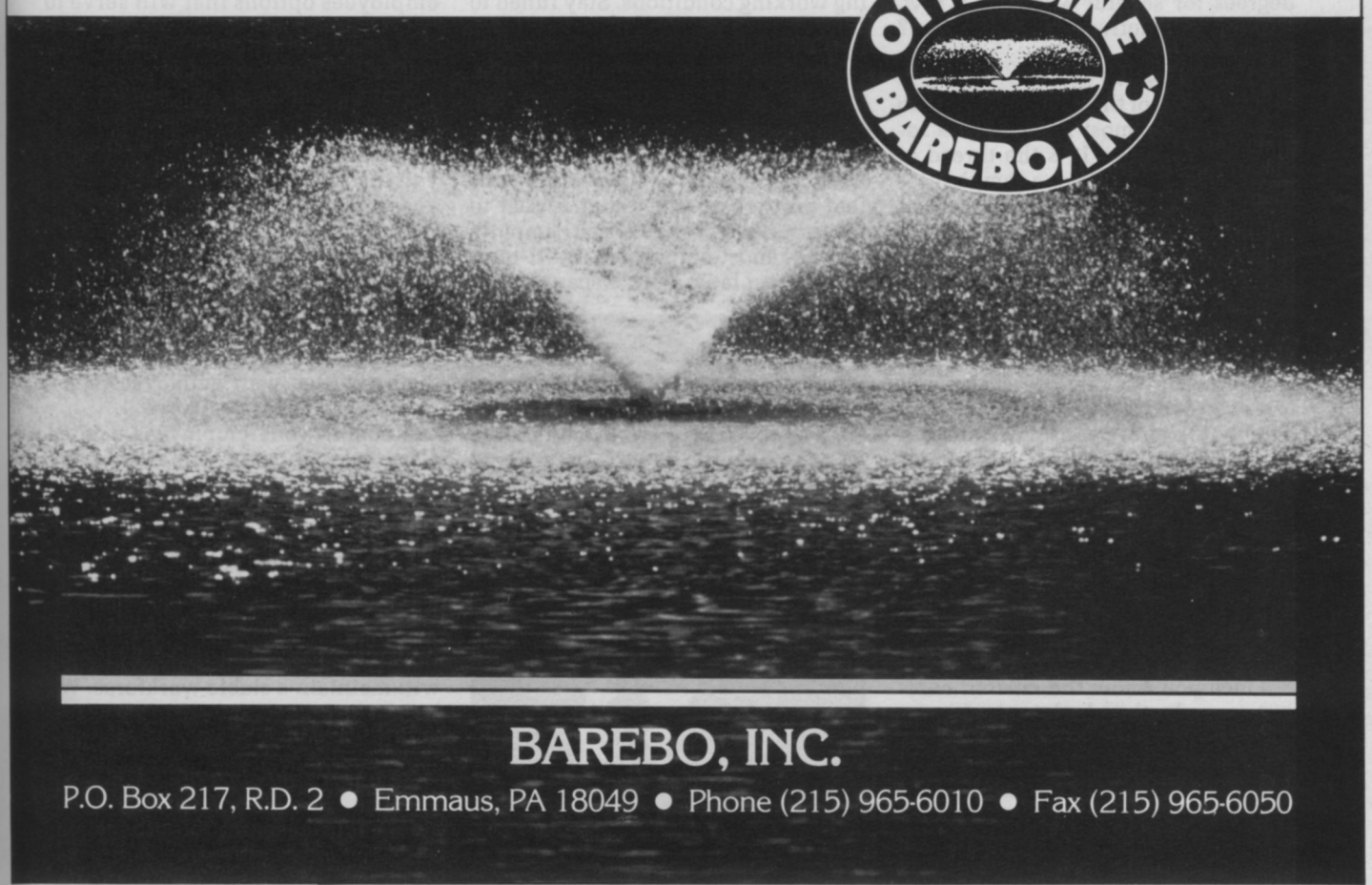

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Circle No. 104 on Reader Inquiry Card

KEEPING THEM HAPPY

Keep your employees' morale high during peaks, valleys and trying times of the year using 'carrots,' motivation and psychology.

by Ed Wandtke

Most companies welcome the nice weather, which brings with it the first of many busy periods of the year. But few managers look forward to the high stress levels associated with these times.

Depending on the location of your company in the different climatic zones, these periods of favorable weather can last from two months to much longer.

What can you do when employees are asked to work extended hours for weeks on end? How do you deal with the issue of no summer vacations? What can you do to encourage your employees to make additional sales when the prime sales season is over? When the temperature reaches 100 degrees for several weeks in a row, how do you motivate the workforce?

Morale boosting

Morale is one of the key ingredients to the success of most lawn service industry companies. It is the thread of cohesiveness that holds a company together year-round, through varied conditions. It is therefore important for the owner of the company to pay attention to conditions in the market that may cause a change in company morale.

Are you seeing competitive pressure, causing you to lose customers? Have you experienced faster than usual growth this spring, causing you to promote someone faster than anticipated?

Any of these conditions can affect the morale of your employees. Now is the time to get your feelers out and determine how the employees are feeling about the company. Don't ask supervisors about employee morale. Get input from the troops and determine their condition for yourself.

Once you know the current company morale, then look to the future. Determine what action may need to be taken to improve the performance of your employees and increase the probability of achieving your annual company goals.

Creating incentives

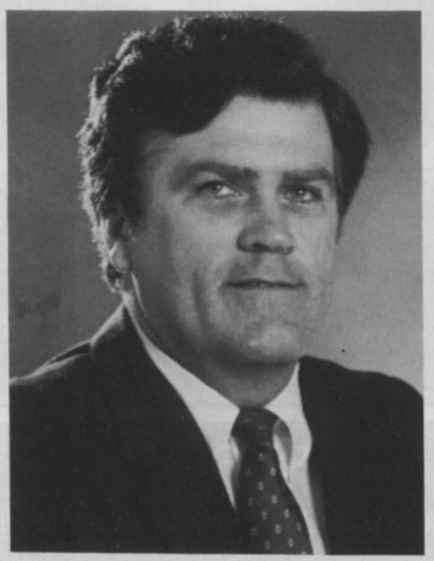
Using incentives to encourage employees is a way to reward employees for making an extra effort. But if the reward is merely for enduring the weather elements or for working an extended period of overtime, you are not employing the right incentive system.

Instead, you need to determine how you can better use part-time personnel to provide your employees a shorter work week, or develop a plan to give production personnel additional time off during the hot summer season.

Time is frequently the most valuable benefit that can be provided to these individuals. Do not overlook this benefit in lieu of heavy hourly production pressure or extremely trying working conditions. Stay tuned to the condition of your employees during high stress times and you will learn when the entire workforce needs a break.

Motivation

Using incentives to motivate means that you create plans that appeal to the needs and desires of your employees. For most employees, short-term incentive plans work because they last less than 30 days. In addition, it's a quick payoff. That pumps up the individuals for having done the extra that earned the incentive.



Ed Wandtke is a senior consultant with All-Green Management Associates, in Columbus Ohio. He focuses on operations and financial questions.

Payoffs can be either cash or non-cash. I have found that service personnel seek cash payoffs most often. But if you have a workforce that treasures other types of rewards, develop a plan to deliver the rewards the employees want most. The success of most incentive plans lies in allowing all employees to win and offers rewards that all of the employees are seeking.

Stroking egos

Judicious use of no Saturday work and "flex" schedules that allow four 10-hour days are methods of offering employees options that will serve to keep their morale up. Dealing with the many egos in any company requires that you engage in constant communication with your employees about how they feel about their job. In addition it is important for you to know what motivates each of your employees. Keep track of the individual needs of your employees and keep pushing their personal reward button.

The art of growing a company requires that you manage your company differently from others in the industry so that your employees enjoy working for your company.

Keeping your employees excited about working for your company means you must constantly monitor employee morale. It is not adequate to merely manage production and assume that your employees are excited about having a job.

As the minimum wage continues to increase, only those companies that attend to the needs of their employees will maintain a stable workforce. We have seen many companies increase productivity and customer loyalty because they paid attention to their employees. This effort is hard and requires that you attend to knowing the morale of your company year round.

The payoff in increased profitability and lower employee turnover will be worth it. **LM**

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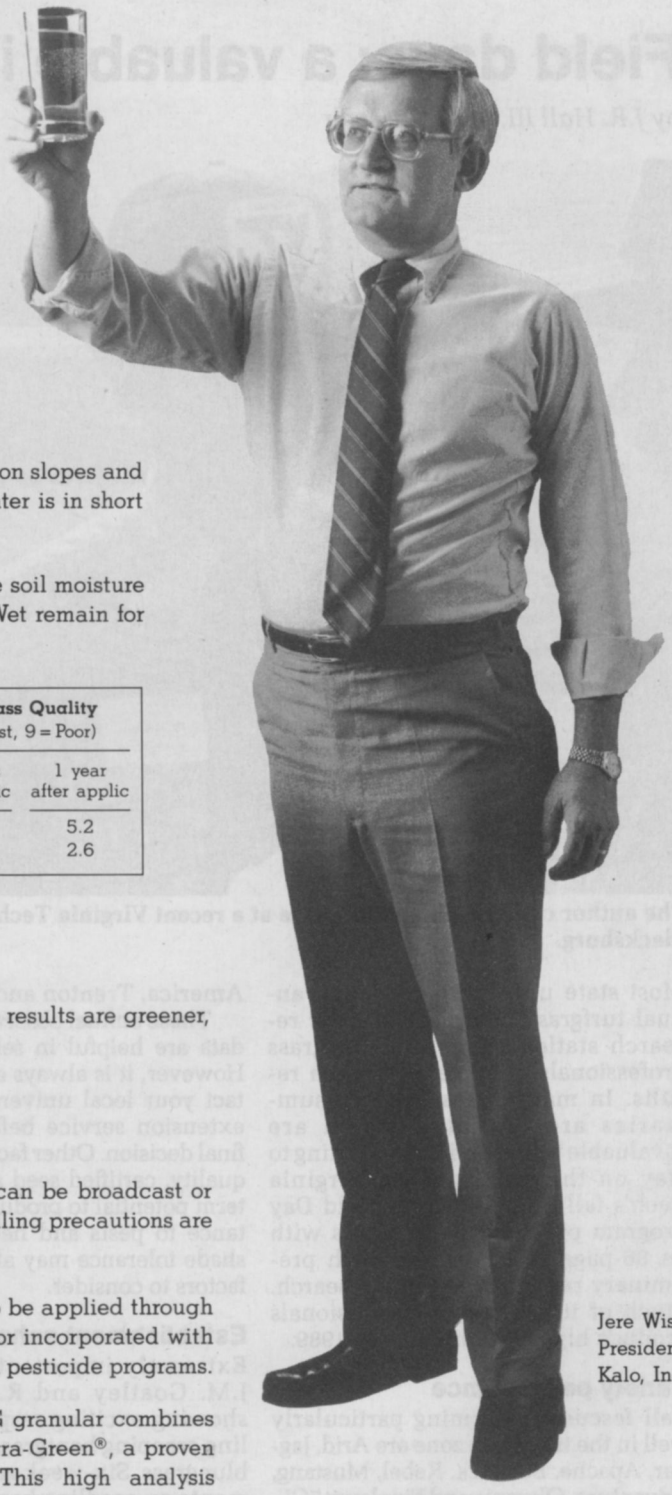

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Check	5.3%	5.4%
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Increased soil moisture	56%	55%

	Turfgrass Quality (1 = Best, 9 = Poor)	
Treatment	2 months after applic	1 year after applic
Check	4.6	5.2
Hydro-Wet	1.6	2.6

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Hydro-Wet Available As Liquid Or New Granular

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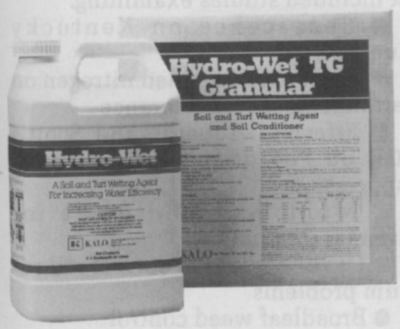

Hydro-Wet can also be applied through irrigation systems or incorporated with liquid fertilizer and pesticide programs.

New Hydro-Wet TG granular combines Hydro-Wet with Terra-Green®, a proven soil conditioner. This high analysis granule contains 22.5% Hydro-Wet, 50% more active ingredient than other granular agents, making it more economical.

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For the location of your nearest distributor and more information about Hydro-Wet, call us.

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Circle No. 126 on Reader Inquiry Card

Field days: a valuable information source

by J.R. Hall III, Virginia Tech

The author confers with an attendee at a recent Virginia Tech Field Day in Blacksburg.

Most state universities conduct annual turfgrass field days at their research stations to inform turfgrass professionals of current research results. In many cases, written summaries are provided which are invaluable to professionals wanting to stay on the cutting edge. Virginia Tech's fall 1988 Turfgrass Field Day program provided participants with an 86-page booklet filled with preliminary results of ongoing research. Much of it could help professionals produce higher quality turf in 1989.

Variety performance

Tall fescues performing particularly well in the transition zone are Arid, Jaguar, Apache, Bonanza, Rebel, Mustang, Adventure, Olympia and Finelawn 5GL. All of these are performing significantly better than Kentucky 31 tall fescue.

Fineleaf fescue cultivars performing particularly well in full sun trials are SR 3000, Aurora, Scaldis, Biljart, Spartan, Bighorn, Waldina, Longfellow, Reliant and Flyer.

Kentucky bluegrasses showing real strength in the transition zone climate are Blacksburg, Midnight, Princeton 104, Lofts 1757, Bristol, Asset, Eclipse, A-34, Challenger, BA73-540, America, Trenton and Estate.

These annual observations of quality data are helpful in selecting varieties. However, it is always advisable to contact your local university cooperative extension service before making the final decision. Other factors such as seed quality, certified seed availability, long term potential to produce quality, resistance to pests and heat, drought and shade tolerance may also be important factors to consider.

Establishment enhancement

Extremely important work by Drs. J.M. Goatley and R.E. Schmidt is showing exciting responses on seedling creeping bentgrass and Kentucky bluegrass. Six-week growth measurements on seedling bentgrass is showing more than a doubling in leaf number, lateral buds per plant, and shoot dry weight per plant with the application of 1 oz. of propiconazole (Banner) per 1000 sq.ft. This same treatment on seedling Kentucky bluegrass more than doubled the number of leaves per plant and lateral buds per plant, while more than tripling shoot and root dry weight. This work bears close watching as the researchers continue to refine the conditions necessary to produce consistent results. Obviously this work will have significant impact on sod production as well as speed of establishment in general turf situations.

Weed control

Extensive work by S.W. Bingham, W.J. Chism and R.L. Shaver on pre-emergence herbicides indicates good crabgrass control is possible with several of the commercially-available materials. Pendimethalin, prodiamine, oxadiazon and benefin + trifluralin showed excellent control in the 1988 studies.

J.L. and J.G. Vollmer and S.W. Bingham reported on studies evaluating annual bluegrass control in Bermudagrass using October and February applied herbicides. They reported that the best combination of consistent annual bluegrass control and least Bermudagrass phytotoxicity was provided by either the fall application of Princep or Kerb. The soil mobility of Kerb was noted as it moved an average of two to five feet out of the plots following a heavy rainfall six days after the application.

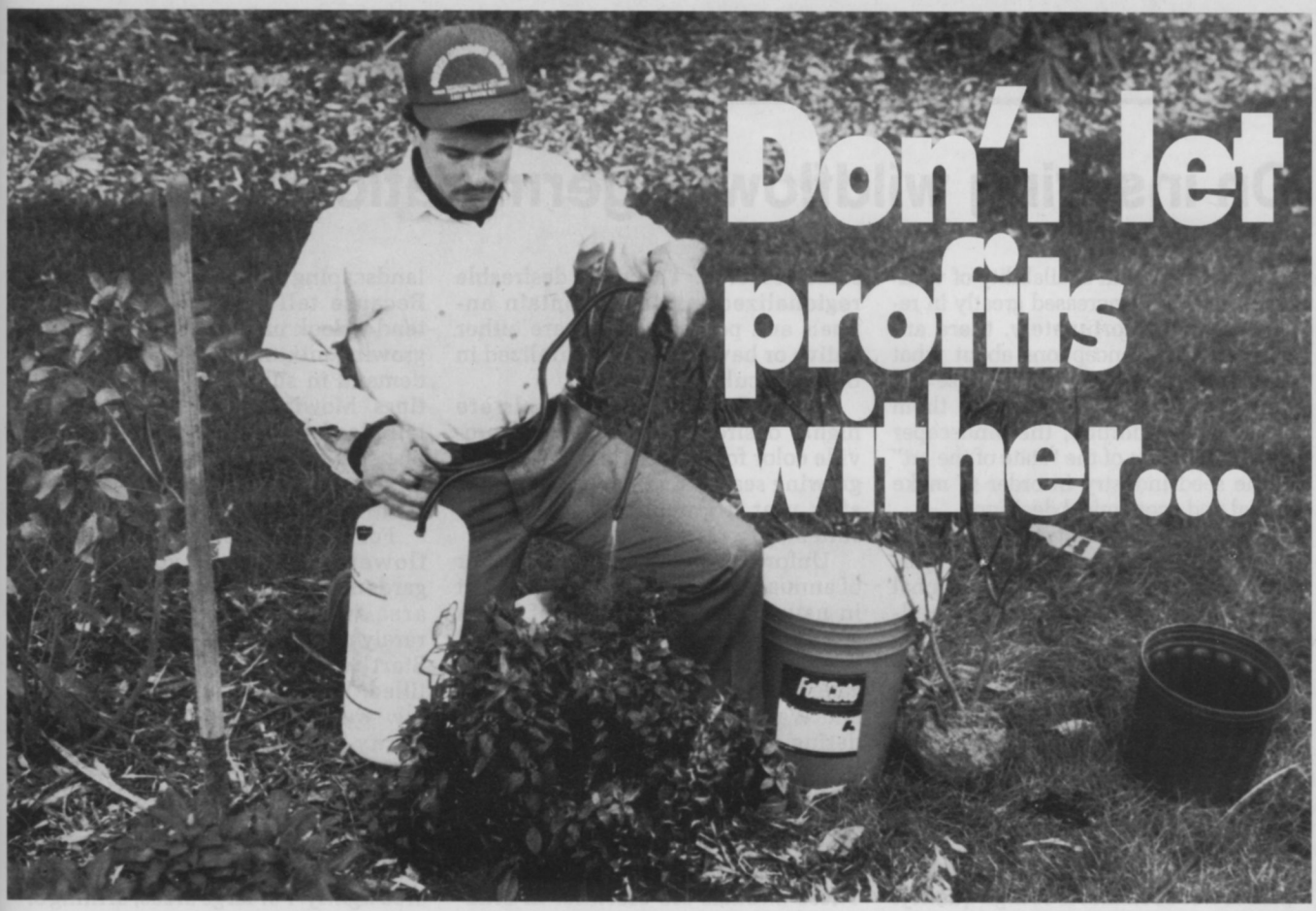
Houston B. Couch reported on standard and candidate fungicide trials for red thread and dollar spot control. Excellent red thread control was provided with experimental fungicides RH-3486 and SDS 66608, however they were not significantly better than several commercially available materials. SDS 66608 also provided very good dollar spot control.

Disease control

Other research in the field day booklet included studies examining:

- Senescence on Kentucky bluegrass
- Effect of fall applied nitrogen on Bermudagrass cold tolerance
- Effect of Aquagro and Scott's TGR on *Poa annua* inflorescence suppression
- Municipal solid waste for turfgrass production
- Use of gypsum to correct soil sodium problems
- Broadleaf weed control
- Growth regulators **LM**

ED. NOTE: A limited number of copies of this field day report are available free of charge upon request. Address requests to: J.R. Hall III, Agronomy Dept., Virginia Tech, Blacksburg, Va. 24060.



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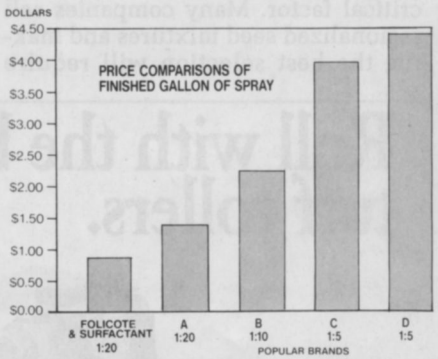

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Circle No. 103 on Reader Inquiry Card

On insuring wildflower germination

The interest in and availability of wildflower seed has increased greatly in recent years. Unfortunately, there are numerous misconceptions about what constitutes the best mixtures to use and how to establish and maintain them properly. In addition, the landscaper should be aware of the "state of the art" in the seed industry in order to make logical and economical decisions.

The use of wildflowers can be divided into two gerneral categories: 1) ornamental landscaping by professional landscapers, homeowners and landscape management personnel, and 2) reclamation, or by mining and construction companies and highway departments. Although these usages are similar in many ways, there are some factors that are unique to each category.

The right seed

First of all, to insure that you are getting the most for your money, buy wildflower seed that is of high quality. Seed should meet state standards for germination, have high purity (more than 95 percent) and contain no noxious weed seeds.

The composition of the mixture is a critical factor. Many companies sell regionalized seed mixtures and making the best selection will require some research. The most desireable regionalized mixtures contain annuals and perennials that are either native or have become naturalized in that particular region.

Native/naturalized annuals are highly desireable because they provide color for long periods during the growing season and may reseed year after year if growing conditions are suitable.

Unfortunately, a limited number of annual species of wildflowers exist in nature throughout most of North America. Notable exceptions include the regions west of the Sierra and Cascade Mountains in California, Oregon and Washington, and the states bordering the Gulf of Mexico. For this reason, most seed companies offer regional mixtures that contain non-native or non-naturalized annuals.

Annuals are essential

These annuals are essential in ornamental landscaping because they provide a colorful display the first year and they act as a nurse crop for the slower-developing perennials. Without annuals in mixtures, most plantings of perennials will be overrun with weeds in the first season.

Also important in ornamental landscaping are height restrictions. Because tall wildflower mixtures tend to look unkept or too wild, low-growing mixtures have been in great demand in suburban and urban settings. Mowing in the fall eliminates tall, dead flowering stalks and helps disperse the seed. Very low-growing mixtures (10 inches or less) do not require fall mowing.

For best results, approach a wildflower planting as you would a garden. Throwing seed out into an area with established vegetation rarely produces a meadow of flowers. Start with bare soil that has been tilled. Water the soil thoroughly, allow weed seeds to germinate, then spray them with Roundup or Kleenup. Rake out the debris. For added protection, repeat this procedure one more time, without tilling the soil again.

If seed is broadcast, rake or drag the area lightly. For large areas, drilling or hydroseeding may be appropriate. Moisture during the early stages is critical. Do not allow the seedbed to dry out for at least four to six weeks. To keep wildflowers at their peak, supplemental watering of up to ½ inch per week may be required, especially in hot, dry weather.

A second method

Here is an alternative planting method to consider when weeds are a major problem: First spray existing vegetation with Roundup or Kleenup. When vegetation is dead, use a slit-seeder to sow seed directly into the debris. This method eliminates tilling the soil, which often brings many weed seeds up to the surface.

Until wildflowers are well established, weed control is important and may be an ongoing activity for at least two growing seasons. Once you can identify the weeds, cutting, spot-spraying and/or hand pulling of weeds are effective ways to eliminate them.

In summary, when purchasing wildflower seed for ornamental landscaping, select high quality mixtures with the most desireable species for the area. Use native or naturalized species whenever possible, with some annuals as a nurse crop. Sow seed on prepared soil. Moisture and weed control are very important. Using these guidelines will insure your success with wildflowers. **LM**

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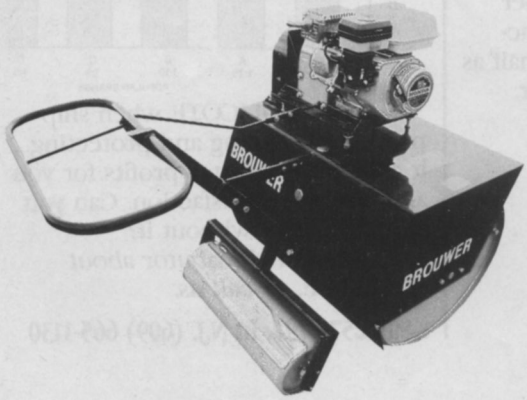

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Circle No. 108 on Reader Inquiry Card

LANDSCAPE MANAGER OF THE YEAR

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LANDSCAPE MANAGEMENT

1988 Landscape Manager of the Year
Roy Peterman

Entry forms are now being accepted by the Professional Grounds Management Society and LANDSCAPE MANAGEMENT magazine for their third annual "Landscape Manager of the Year" award.

The purpose of the award is to recognize superior job performance among landscape managers, to challenge those involved in the industry, to achieve higher standards of excellence and to bring national recognition to deserving managers.

Any person directly responsible for the professional maintenance of one or more landscapes is eligible to enter. Applicants will be judged according to job performance, honors and awards, procedures and philosophies, and contributions to the green industry. Applicants will be asked, at the time of entry, to submit four 5 x 7 black-and-white glossy photos and 10 color 35mm slides of current work areas with a short narrative on each.

(clip and mail)

Applicant's name **Title**

Applicant's company

Official entry form should be sent to:

Name **Title**

Company

Address **City/State** **Zip Code**

Mail to: PGMS, Landscape Manager of the Year,1201 Galloway Ave.,Suite 1E, Cockeysville, MD 21030, 301-667-1833

PRODUCTS

New granular battles mole crickets, white grubs

Chipco 5G insecticide effectively battles mole crickets and white grubs, Rhone-Poulenc says.

The 5 percent granular product was recently registered for control of the pests and other sub-surface turfgrass bugs on home lawns and commercial turf such as golf courses and sod farms.

The product is also registered for control of chinch bugs, black turfgrass ataenius beetles, bluegrass billbugs, sod webworms and nematodes.

To control mole crickets, apply at the rate of 4.5 lbs. per 1000 sq. ft. or 200 lbs. per acre. Irrigate immediately after application to increase safety and efficacy.

For white grub control, apply at the rate of 2.25 lbs. per 1000 sq. ft. or 100 lbs. per acre. Irrigate immediately afterward.

Circle No. 201 on Reader Inquiry Card

Hybrid flower shrubs hardy and are easy to maintain

The Meidiland family of hybrid flowering shrubs is especially bred for color, texture, hardiness and low maintenance.

The Conard-Pyle Co.'s new family of hybrid flower shrubs is now available in five varieties, consisting of three hedge types and two ground covers.

The Pink Meidiland, Bonica and Ferdy provide upright growth that is well suited for hedges or barriers, masses for color and texture and as free standing plants.

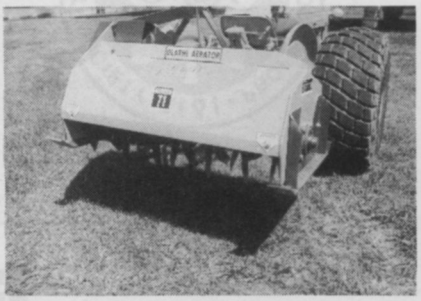
The groundcover varieties are the White and Scarlet Meidiland, which provide a dense carpet of foliage and blooms that cover slopes and banks well, says Conard-Pyle.

Circle No. 202 on Reader Inquiry Card

Aerator goes the extra foot

The Olathe Model 71 Deep Shatter Aerator is designed for heavily-compacted, high traffic areas. It is useful in loosening compaction below levels reached by conventional coring machines.

Vibrations have been recorded down to one foot below the surface, at a blade depth of 4½ inches. Other features include PTO-powered, ratchet PTO shaft for drive line protection, 42 blades on seven inch centers, adjustable in ⅝ inches from 4½ inches deep to one inch positive. Seeder and dragmat are optional.



Circle No. 203 on Reader Inquiry Card

Hand-held blower has many features

Maruyama's new commercial hand-held blower moves 400 cu. ft. per minute at 140 mph. The 21.2 cc engine, built to commercial specifications, features a chrome cylinder and heavy duty ball bearings.

The primer-type carburetor and electronic ignition permit easy starting. The variable throttle also features high, medium and low settings so that the operator can set it to run without continually working the throttle itself.

Optional vacuum attachments are available, making this a versatile blower/vac.

Circle No. 204 on Reader Inquiry Card

Wheel loader has operator in mind

The new JI Case Model 621 wheel loader was designed with the operator in mind, the company says. Two of the features designed into it are a 359 cu. in. turbocharged engine and an operator compartment with a four-level systems monitor.

The 621 has working speeds of 4.1 and 7.4 mph and a maximum road speed of 23.9 mph. A simple twist-grip lever gives the operator precise control of speed, power and direction. Its heavy duty loader arms provide a breakout force of almost 25,000 lbs. when equipped with a 2.25 cu. yd. bucket. It's Z-bar loader linkage increases performance and component durability, the company notes.

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Circle No. 132 on Reader Inquiry Card

The Model 621 lifts more than 10,000 lbs. to full height, and has a dump clearance of 9 ft. 4 in.

Circle No. 205 on Reader Inquiry Card

Hydraulic reel mower has 3 cutting units

The Huxley TR84M hydraulic reel mower is equipped with three cutting units that give it a maximum working width of 2.13 meters.

The two forward units can be folded vertically for safe, convenient transport or to assist operation in confined areas.

Circle No. 206 on Reader Inquiry Card

Mower has 135-inch reach to each side

The Micro-Mower model MP135T is available for tractors from 19- to 30-inch horsepower. Reaching 135 inches horizontal either left or right side, the mower's cutting is controlled via electric/over hydraulic valve from tractor seat.

There is a choice of a 52-inch multipurpose or 44-inch finish flail cutting heads. In addition, a three-point hitch with mounting stabilizers is included.

Circle No. 207 on Reader Inquiry Card

Maxi System offers Flo-Manager feature

Rain Bird's Maxi System IV computer control system features the Flo-Manager. The Flo-Manager manages the water flow demand placed on the pumping system while maintaining flow rates throughout the course to be consistent with piping network capacities. Rain Bird says this results in a balance that lets the system operate consistently at maximum capacity and efficiency, while also staging pumps to eliminate shock, surge and overloading.

Circle No. 208 on Reader Inquiry Card

Fungicide gets EPA approval

Ciba-Geigy has obtained label approval for its Pace fungicide, which the company says provides superior control of Pythium blight and yellow tuft in all turfgrasses, and downy mildew in St. Augustinegrass.

Pace is packaged in water-soluble bags and sold in GreenPaks. Each GreenPak contains two one-pound bags, enough to treat a 5,000 square-foot golf green. The recommended rate is 6.3 oz. per 1,000 sq. ft. in three to

five gallons of water.

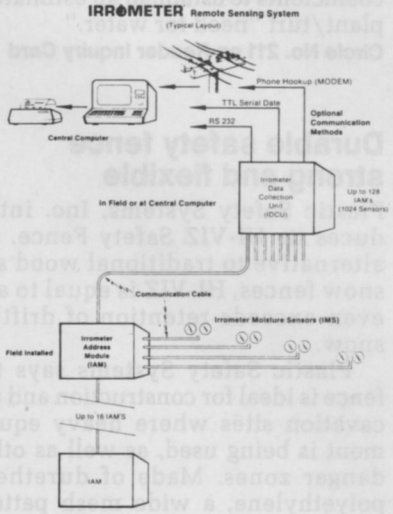
The water soluble packets dissolve within three minutes.

Circle No. 209 on Reader Inquiry Card

Remote sensing system helps save water

The Irrometer Co. of Riverside, Calif., now markets its new generation of soil moisture sensing equipment. Irrometer says the Remote Sensing System utilizes the true tensiometric method of soil moisture measurement which has been the industry standard for more than 60 years.

From a central location, the system



reports on demand the soil moisture status at various locations throughout

continued on page 90

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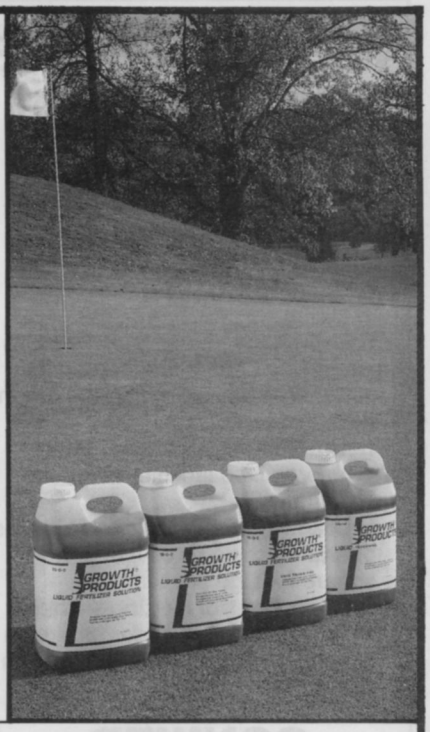

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• NO SPECIAL MECHANICAL AGITATION	*NO $$ INVESTMENT*
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• NON ABRASIVE TO PUMPS	*LESS REPAIRS*
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Circle No. 123 on Reader Inquiry Card

the landscape or golf course.

An added feature is information on problem "locations" which are being severely under-irrigated and causing the Irrometers to break suction due to irrigation problems.

It also eliminates the inaccuracies of weather-based estimates of ET and the complicated formulas using crop coefficients to establish an estimate of plant/turf "need for water."

Circle No. 211 on Reader Inquiry Card

Durable safety fence strong and flexible

Plastic Safety Systems, Inc. introduces its HI-VIZ Safety Fence. An alternative to traditional wood slat snow fences, HI-VIZ is equal to and even exceeds retention of drifting snow.

Plastic Safety Systems says the fence is ideal for construction and excavation sites where heavy equipment is being used, as well as other danger zones. Made of durethene polyethylene, a wide mesh pattern with greater surface area provides high visibility.

The HI-VIZ fence is acid and salt resistant. Available in 100 foot rolls.

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Circle No. 111 on Reader Inquiry Card

Circle No. 212 on Reader Inquiry Card

Growth Products line expands in 1989

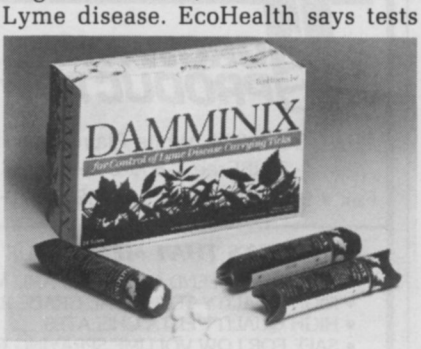
Growth Products of White Plains, N.Y. has expanded its professional liquid slow-release fertilizer line. Four new products are available in addition to the exclusive Nitro-26 CRN Methylene diurea product. Nitro-26 is currently sold in the U.S. and Canada in bulk and drum quantities.

The lead product is a complete liquid blend of slow release nitrogen, potassium, phosphorus and EDTA micronutrients. Product is available in 2-1/2 gallon containers for special turf, tree and ornamental applications.

Circle No. 213 on Reader Inquiry Card.

New weapon in war against Lyme disease

Damminix from EcoHealth, Inc. has been proven to be effective in controlling the deer tick, the main carrier of Lyme disease. EcoHealth says tests



achieved a 97 percent reduction in the incidence of ticks or infected ticks.

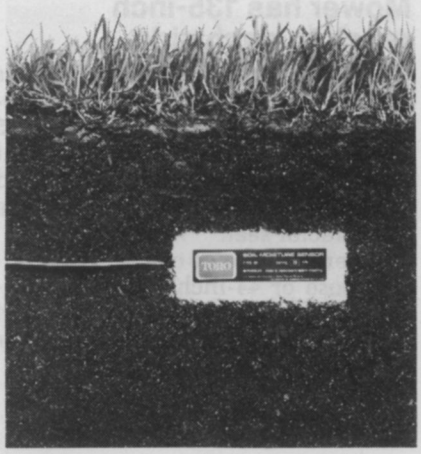
Damminix is biodegradable cardboard tubes filled with cotton balls that have been soaked in permethrin, a mild insecticide. The tubes are placed in a grid pattern in the affected area in the spring and late summer. Mice gather the cotton balls for nesting material. In the nest, the treated cotton kills the ticks feeding on the mice.

Circle No. 214 on Reader Inquiry Card

Moisture sensing system cuts water consumption

Toro's Irrigation Division says its new Soil Moisture Control System effectively reduces irrigation water consumption by an average 50 percent while maintaining excellent turf quality.

The system is designed to tell the irrigation controller when to stop irrigating rather than when to start. A



Cuming-type 4-EC ceramic soil sensor is completely inert, self-compensating, permanently calibrated and maintenance free. The sensor is manufactured to dehydrate at a preset tension level close to the soil's moisture capacity.. This changes the sensor's output, which sends a signal to the irrigation controller when the soil is moist enough.

Circle No. 215 on Reader Inquiry Card

Hustler 275 cuts down tall, wet grass

The Hustler 275 from Excel features a 23-hp, air-cooled Kohler engine. The fully pressurized lubrication system ensures continuous protection of critical engine parts for long service life. Improvements include new Ross ME high-torque motors with 1 3/8 shaft and an improved bearing for longer wear. A 10 micron filter replaces the 25 micron filter on the hydraulic system for even better protection of the drive motors.

The 275 utilizes the Dual-Path hy-

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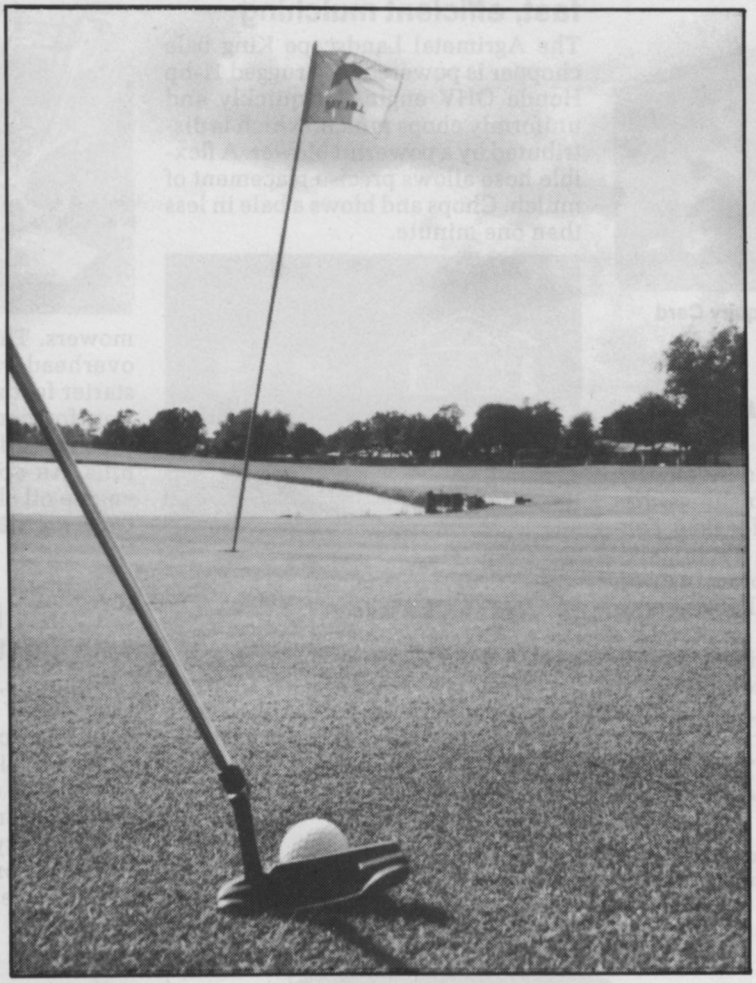

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drostatic drive system and one hand hydraulic steering that provides total control of speed, forward and reverse, braking and turns without the use of clutch or brake pedals. Twin lever steering allows 360-degree turns without scuffing the turf.

Circle No. 216 on Reader Inquiry Card

Park equipment out in new catalogue

Natural Structures, builders of park equipment and site furnishings, has issued its new catalogue for 1989. Featured are the new "High Tech Look" of beautiful and bright colors in durable round or square steel post modular play systems.

Also featured are a wide selection of independent play components, climbers, outdoor fitness centers, courses and recreation courts.

Circle No. 217 on Reader Inquiry Card

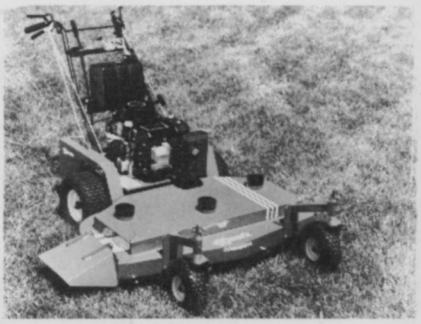
Bale chopper delivers fast, efficient mulching

The Agrimetal Landscape King bale chopper is powered by a rugged 11-hp Honda OHV engine. It quickly and uniformly chops mulch, which is distributed by a powerful blower. A flexible hose allows precise placement of mulch. Chops and blows a bale in less than one minute.

Circle No. 218 on Reader Inquiry Card

Exmark intermediates powered by Kawasakis

Exmark Manufacturing Company, Inc. now offers a 14-hp Kawasaki engine on its 48″ and 36″ commercial

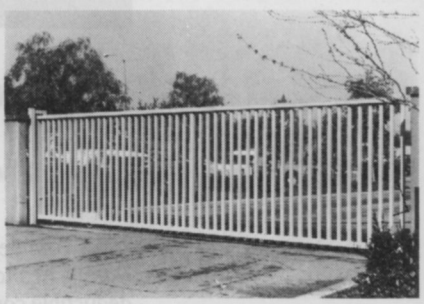


mowers. The four-stroke, air-cooled, overhead valve engine with recoil starter features full-pressure lubrication for consistent operation, even with extended mowing on slopes and hills. An optional oil filter kit keeps engine oil cleaner.

Circle No. 219 on Reader Inquiry Card

Security is yours with Customline gates

Customline, Inc. manufactures security gates and fences for light industrial, commercial or residential use. Each piece is factory tested, and guaranteed against defective materials and workmanship. The V-series offers heavy duty electric locks for swinging or sliding gates, or with ground level wheels fabricated from solid steel.



Circle No. 220 on Reader Inquiry Card

Be creative with retaining walls from Keystone

The Keystone Retaining Wall Systems combine proven soil stabilization technology of geogrids as an integral part of its design.

Based in Minnesota, the company has licensed manufacturers in 48 major metropolitan areas who provide the product throughout the United States and Eastern Canada.

According to Keystone, the sys-

The Brouwer Trash-Pik™..

The Trash-Pik™ is the innovative method for picking up litter at municipal locations, theme parks, airports, shopping malls, car parks and such places.

Some outstanding features:

- **18 h.p. two cylinder Kohler gas engine**
- **Closed loop hydraulic hydrostatic drive**
- **200 degree nozzle operating arc**
- **Reverse air-flow to remove hose blockages or blow leaves or litter for easy pick-up**
- **The 8 cu. ft. litter container bag tilts back for easy unloading**
- **Heavy-duty, corrosion free fibre-glass body**

Solve your litter collection problems, fast, efficiently.

Call your Brouwer dealer for more information or a demonstration...TODAY.

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An Outboard Marine Corporation Company

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Fax. (313) 459-8778

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Circle No. 106 on Reader Inquiry Card

Some of life's best lessons are learned in the school of 'soft knocks'

The young man on the left will fall several times before he hits his first home run. The young man on the right wants him to have the advantage of falling on real turf.

We think it's curious that the same lawmakers who insist that individuals and corporations make environment and products safer for children neglect to legislate safer standards for school playgrounds.

It's no doubt easier to make us spend our own cash to improve conditions than to appropriate public funds for safe playing areas.

Things are changing ... slowly ... but NSTC has been instrumental in distributing information and talking to some appropriate people, but it all takes time and money.

While we're waiting for the big picture to change, we can all improve our little corner ... like planting an improved turf plot of our own, then using it! When officials see how much more fun we're having, they'll no doubt want in on the action.

For free brochure and membership application, call or write to Fred V. Grau, Chairman

NSTC
NATIONAL SPORTS TURF COUNCIL

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Beltsville, MD 20705
301/344-3655

tems are considered by landscape design engineers to be the premier retaining wall product offering unlimited design characteristics, structural integrity, ease of installation, durability, economy, and a curval lineal, split face, natural appearing product.

Circle No. 221 on Reader Inquiry Card

Walk greensmower brand new from Toro

Toro reports that its new walk greensmower features the smallest clip of any walk greensmower on the market, allowing for a more uniform cut.

The Greensmaster 1000 clips as small as .16 inch, thanks to its 11-blade design. The mower is also designed with a loop handle for operator comfort and proper weight distribution.

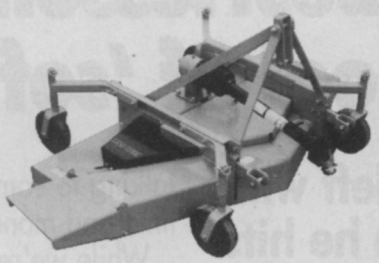
The Greensmaster is powered by a 3 1/2-hp Kawasaki engine, and the drive system features the latest cog belt design, which reduces service time.

Cutting height can be adjusted to tournament height, 3/32 inches. A grooming reel attachment and variety of rollers are available.

Circle No. 222 on Reader Inquiry Card

Grooming mower stands up to grass

The new Land Pride Air Tunnel Grooming Mower combines superb mowing quality, structural strength and operator convenience. The Air Tunnel system lifts grass for superior clipping and discharge. Heavy duty high speed blades turn at 15,000 square feet per minute for aggressive cutting. Four-wheel design, floating



hitches and swivelling top-link follow terrain evenly. Ground wheel options include two wheels and front roller, two ground wheels only and four ground wheels for "the best in contour mowing."

Land Pride says the unit's welded tubular steel chassis absorbs the shock of severe mowing conditions. A single, durable continuous belt drives all three austempered blades. A clevis hitch makes for easy hookup, while in-and-out hitch blocks allow the mower to stay close to the tractor.

Circle No. 223 on Reader Inquiry Card

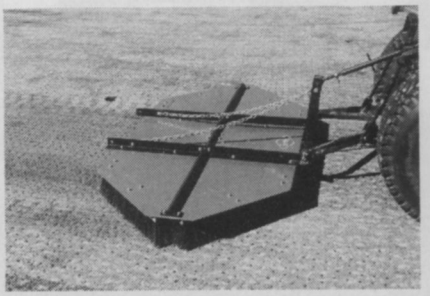
Turf brush for better dressing

Gandy's Sweep Master turf brush is a newly designed tool for improved top dressing incorporation and more effective surface maintenance on golf courses and athletic fields.

The unit measures 40" x 78" and includes eight individual brushes set in a double diamond pattern. The upper framework is made of 11-guage steel with 3/8" angle crossmembers.

Gandy says the Sweepmaster is designed to give improved blending of soil amendments and reduce chatter or jumping during its sweeping actions, leaving a clean appearance on greens, tees, clay tennis courts, sand areas and athletic fields.

The basic brush unit may be ordered alone for suspension under utility tractors, or with optional 3-point hitch or trailer wheels. The trailer version has wheels which flip up to



rest on the upper framework and make it handy to move during storage.

Circle No. 224 on Reader Inquiry Card

Self-propelled seeder

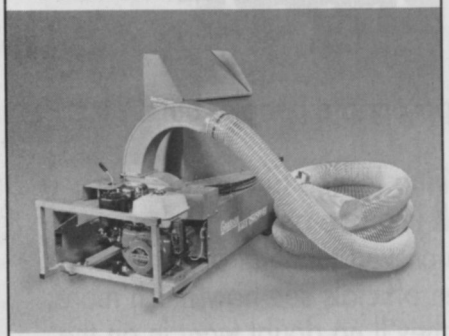
The new Brouwer Seeder/Overseeder is a self-propelled unit for seeding, overseeding and fertilizing. The optional fertilizer hopper and overseeder attachments are easily attached. The unit is powered by a Honda 5-hp engine with a heavy duty chain and gear drive for excellent traction in a variety of conditions.

Gear driven, contra-rotating blades and guides place the seed precisely, in adjustable depth slits that are 1 ½

inches apart. Offset wheels then cover the seed for the best possible germination conditions. The operating width is 22 inches and the seed flow is calibrated for efficient distribution.

Circle No. 225 on Reader Inquiry Card

THE MULCHING SOLUTION



Now you can cut mulching time by up to 75%. And get excellent coverage that significantly improves moisture retention and germination.

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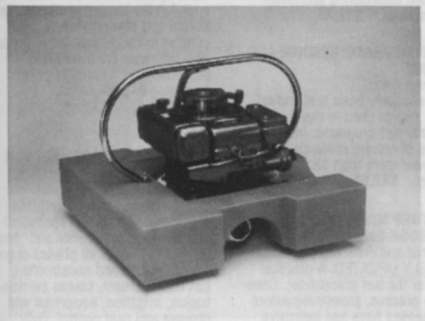
Circle No. 122 on Reader Inquiry Card

Portable pump runs on a Briggs/Stratton

The Otterbine floating, portable pump is now available with the 8-hp, 4-cycle Briggs & Stratton I/C engine. The engine has a five-year warranty, and is equipped with an extra-capacity dual element air cleaner, commercial quality ball bearings, cast iron sleeves and Cobalite exhaust valves and seats.

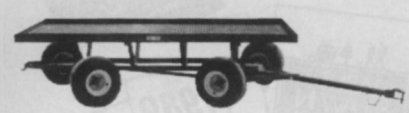
Warranty on the engine's Magnetron electronic ignition is five years. The pump delivers up to 410 GPM. It's self-priming, can run dry safely, and operates in three inches of water.



Circle No. 226 on Reader Inquiry Card

One good turner carries it weight

Agrotec tracking wagons are available in three sizes, each equipped with front and rear axle steering which allows for sharper, tighter turns to eliminate cut off corners and damaged



plants and containers. The frame is made of heavy guage steel, steam cleaned, primed and painted with high gloss green enamel paint. Four bolt cast iron hubs and large terra tires also allow for much larger loads than other standard tracking wagons.

Circle No. 227 on Reader Inquiry Card

Kubota's newest tractor equipped with Glideshift

Kubota Tractor Corporation's L2850 utilizes a Glideshift transmission for easy no-clutch shifting through eight forward and reverse speeds. Engine and clutch stress is reduced, and operator fatigue is minimized.

The 4-wheel drive tractor is

powered by a four-cylinder, liquid-cooled diesel engine with 27 PTO horsepower and 34 gross horsepower.

Circle No. 228 on Reader Inquiry Card

Quick-change tractor becomes turf mower

The John Deere 86-inch reel mounted mower package turns a compact tractor into a turf mower. It includes three 30-inch hydraulically-driven mowers that can be attached to a John Deere model 755 or 855 compact utility tractor.

For other jobs, the rear sub-frame can be removed in minutes to expose a rear PTO and drawbar. The hydraulic reel drive pump is powered by the tractor's mid-PTO. Reels turn at about 940 rpm for a consistent cut. Reels are raised and lowered by the tractor's open center hydraulic system. Both tractors are powered by a 3-cylinder diesel engine. The 20-hp 755 delivers 15-hp at the PTO; the 24-hp 855 delivers 19 hp at the PTO.

Circle No. 229 on Reader Inquiry Card

New riding mowers for heavy duty use

Ransomes, Inc. has introduced a new line of commercial riding mowers for heavy-use applications. Designated as the Jaguar 4000 line, Ransomes believes the four mowers incorporate the best in rotary mowing technology. The Jaguar 4000 has mowing decks of 61″ or 74″. The larger deck has a unique, deep-draft design which helps assure that all clippings are discharged out the chute, minimizing unsightly clumps.

A single-pedal hydrostatic control is standard on the units. The low effort foot pedal controls all forward and reverse movement and eliminates the need for cruise control. An automatic differential lock provides drive wheels with steady pulling power on the straightaway, while reducing the torque on the inside wheel during turning.

Mitsubishi and Onan engines are available.

Circle No. 230 on Reader Inquiry Card

ZTR mower with Unistat direct drive

A heavy duty zero turning radius mower called the Commercial Clipper is new from Shivvers Incorporated of Corydon, Iowa. The mower features the Unistat direct drive hydrostat on each power wheel. All-in-one direct drive hydraulic transmission increases reliability and efficiency. It is backed with a 4-year, 4,000-hour commercial service limited warranty.

Circle No. 231 on Reader Inquiry Card

New trimmer, brush cutter lightweight with options

The new Robin model NB351 grass trimmer/brush cutter is now available from Carswell Import & Marketing Associates. The straight shaft trimmer is built to professional and commercial standards and weighs only 15.8 lbs.

The new model features a 34.4 cc (1.8 hp) high performance Robin-built engine and an anti-vibration drive shaft with a 14:17 gear ratio. Standard equipment includes the dual-feed nylon cord trimmer head that cuts a 16-inch swath, a 10-inch saw blade, blade guard, tool kit, quick-release shoulder harness and instruction manual.

Optional accessories include 10-inch eddy blade, 10-inch star blade and safety blade.

Circle No. 232 on Reader Inquiry Card

BOOKSTORE

010 - ADVANCES IN TURFGRASS PATHOLOGY
by Joyner and Larsen
Leading U.S. turf pathologists report on turfgrass diseases, pythium blight, snow molds, fairy rings, leaf spot of Kentucky bluegrass in Minnesota, initial and field fungicide screening, turfgrass disease resistance, etc. Contains new ideas on how to combat turfgrass problems. **$27.95**

235 - LAWN CARE: A HANDBOOK FOR PROFESSIONALS
by H. Decker, J. Decker
Written by turfgrass professionals, this handy guide will be invaluable for playing field managers, golf course managers, or any lawn care practitioner. Covers all aspects of turfgrass management. **$36.00**

645 - MANAGEMENT OF TURFGRASS DISEASES
by J.M. Vargas
Identifies turfgrass diseases by description and illustration. Includes a holistic approach to healthy turf and lawns. Presents practical management strategies for golf courses, lawns and athletic fields. 204 pages, illustrated. **$26.70**

620 - TURF MANAGEMENT HANDBOOK
by Howard Sprague
Practical guide to turf care under both healthy and poor turf conditions. Chapters cover turf in cooler and warmer regions, fertilizer use, regular turf care, weed and disease control and special turf problems. Useful seasonal schedules for management of turf areas. **$25.25**

220 - CONTROLLING TURFGRASS PESTS
by Shurtleff, Fermanian, Randell
New comprehensive guide provides the most up-to-date information available on the identification, biology, control and management of every type of turfgrass pest. **$36.00**

640 - TURF IRRIGATION MANUAL
by James Watkins
A guidebook for engineers, architects, designers and contractors. Keeps pace with the latest developments in turf and landscape irrigation. Specific chapters devoted to rotary sprinkler design systems. Golf course design systems and expanded engineering and reference material. **$27.25**

630 - TURFGRASS: SCIENCE AND CULTURE
by James Beard
Comprehensive basic text and reference source used in many leading university turf programs. Includes findings of current research compiled from more than 12,000 sources. **$42.00**

110 - TURF MANAGERS' HANDBOOK-Second Edition
by Daniel and Freeborg
ENTIRELY UPDATED. A practical guide for the turf practitioner. Chapters on grasses, growth regulators and diseases have had extensive modification. Innovations resulting from research and practice have been added to reflect the current techniques available for turf managers. **$32.95**

230 - LAWNS-Third Edition
by Dr. Jonas Vengris and Dr. William A. Torello
Designed as a textbook or a practical usage manual, this book has been completely brought up-to-date. Care of lawns and turfgrass, from selection of varieties to maintenance of established grass is completely covered. **$25.95**

225 - TURFGRASS MANAGEMENT
by A.J. Turgeon
Revised edition. Covers the latest developments in turfgrass science and technology. Heavily illustrated with dozens of new drawings. Provides specific recommendations for applying the newest pesticides, fertilizers and other materials to combat turfgrass problems. A valuable reference for diagnosing problems and determining their causes. **$42.00**

615 - TURF MANAGEMENT FOR GOLF COURSES
by James Beard
Written by an eminent turfgrass researcher, this USGA sponsored text is an ideal reference and "how to" guide. Details all phases of golf course design and construction, turf management, course administration, irrigation, equipment and disease and pest control. Fully illustrated. **$52.75**

410 - DISEASES & PESTS OF ORNAMENTAL PLANTS
by Pascal Pirone
This standard reference discusses diagnosis and treatment of diseases and organisms affecting nearly 500 varieties of ornamental plants grown outdoors, under glass or in the home. Easy to understand explanations of when and how to use the most effective fungicides, insecticides and other control methods. **$37.95**

415 - INNOVATIVE APPROACHES TO PLANT DISEASE CONTROL
by Ilan Chet
Brings together alternative approaches and methods that have potential to control diseases caused by fungi, bacteria and viruses. Major concepts of disease control discussed include biological control systems, their possible mechanisms, potential application and genetic improvement. **$52.50**

800 - THE GOLF COURSE
by Cornish and Whitten
The first book ever to give the art of golf course design its due, and golf course architects the credit and recognition they deserve. 320 pages and 150 color and black and white photographs. Traces the history and evolution of the golf course, analyzes the great courses, shows how they were designed and constructed. **$35.00**

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by Lori Thomson Harvey and W.T. Thomson
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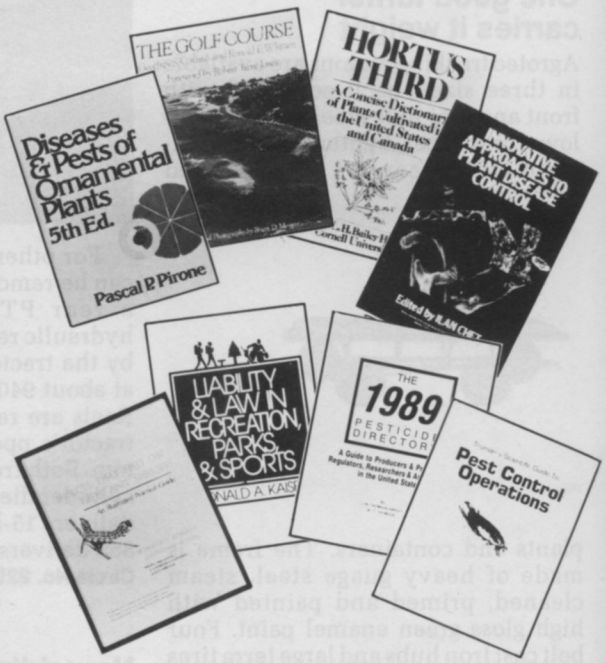
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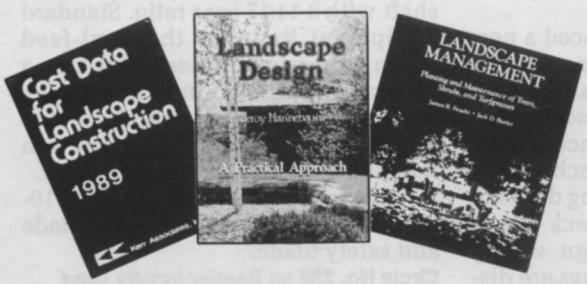

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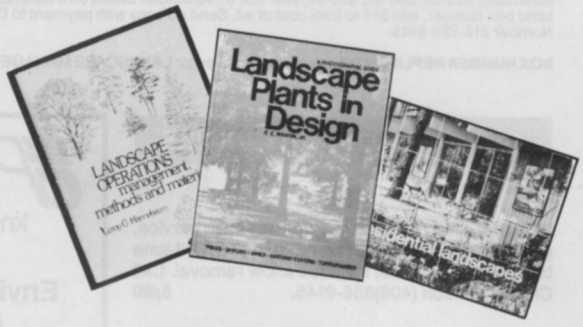
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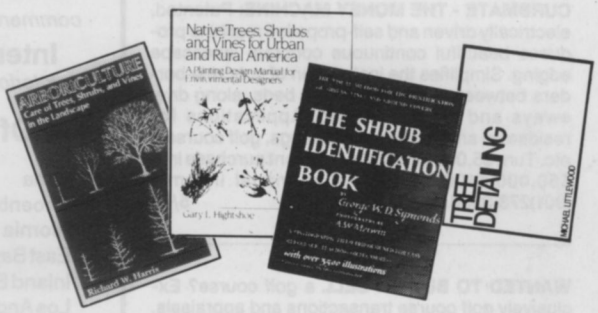
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PROBLEM MANAGEMENT

by **Balakrishna Rao,** Ph.D.

Why wait to fertilize?

Problem: *When liming, why should you wait two weeks to fertilize when using an ammonium-based source of nitrogen in your fertilizer? (New York)*

Solution: Reports indicate that it is important to delay fertilizing when applying lime because of the potential for burn. Richard G. Rathjens, senior agronomist at Davey Tree, indicates that when both hydrated lime and ammonium nitrate fertilizer are applied, they react and release ammonium gas, which can cause injury to turfgrass. This general rule is applied to any type of ammonium fertilizers mixed with lime.

Because ammonium is formed during conversion of nitrogen to plant-available forms, it is our practice to avoid applying lime with any quick-release fertilizer, such as urea, Formolene, Fluf, etc.

As an added precaution after liming, delay the fertilizer treatment until the lime is washed into the soil through post-watering and/or rain. This would help minimize the burn potential.

The general rule of thumb of waiting for two weeks may not be sufficient if there was no post-watering or rain to wash the lime and move it into the soil.

Micro-nutrient content important

Problem: *A lot of research has been done on nitrogen fertilizer to cool-season turfgrass (amounts of N, timing). But what about phosphorus, potash and the micro-nutrients? After testing for these nutrients, do we correct the soil pH? Should we deep-place the nutrients after we aerify or do we top dress with a commercial fertilizer blend that comes close to the recommendation?*

For example, we test golf course greens from 0 to 3 inches for micro-nutrients and from 3 to 6 inches for macro-nutrients. We then aerify and make corrective applications, starting with the pH and micro-nutrients, then the phosphorus and potash. During the season, we use a fertlizer with slow-grade release nitrogen, sulfur and potash. Foliar applications of iron are used to prolong the cosmetics of the greens between fertilizer applications.

I have heard that other superintendents use a starter fertilizer in May and in September. Their greens do have enough phosphorus, so why the starter fertilizer? (Minnesota)

Solution: Because of space limitations in this column, I will not be able to comment individually on several products you have been using in your program. Most everything that you are doing appears to be agronomically sound. If for any reason you are not pleased with the color, density or quality of turfgrass, then your best approach would be to consult with a professional agronomist familiar with golf course maintenance practices.

Fertilization and any nutrient correction should be based on soil test results. If the soil test results indicate adequate levels of micro-nutrients, there is no need to add those. If the soil test shows adequate levels of phosphorus, it doesn't have to be routinely applied in maintenance programs. However, routine application of phosphorus can be done without causing any harm.

Starter fertilizers are low in nitrogen and high in potassium and phosphorus. Supplemental phosphorus is particularly helpful in newly-seeded areas since soil phosphorus does not move readily to the developing roots. For established turfgrass, consider applying phosphorus after aerifying for deeper movement.

Another point of concern is that sandy soils, because of their low chemical activity, have a greater potential for nutrient deficiency than most other soils. Therefore, follow the soil test recommendations and provide the deficient nutrient.

The source of palm rot

Problem: *What is the best way to solve a scale infestation of palm rot in an interior landscape on retina palms—assuming water, temperature, humidity and soil check out? (California)*

Solution: The first step in pest management is to identify the agent(s) responsible for the disorder. Sometimes stress factors and/or cultural factors may lead to pathological or insect problems. Therefore, first determine whether the problem of palm rot you are referring to is caused by scale alone or if it is a disorder complex.

If the problem was identified to be related to scale insect, you can use a number of insecticides to manage them. Ohio State University (OSU) recommends the following for scale management in general for indoor use:

- Bendiocarb (Ficam, Turcam 76WP): avoid overspraying, as heavy runoff may injure the roots of some species.
- Kinoprene (Enstar 5E): an insect growth regulator.
- Oxamyl (Oxamyl 109): a systemic granular insecticide; woody stems may reduce uptake.

For best results OSU scientists suggest repeating applications at three to four week intervals for three months (three or four applications). Read and follow label specifications for best results. **LM**

Balakrishna Rao is Manager of Technical Resources for the Davey Tree Co., Kent, Ohio.

Questions should be mailed to Problem Management, LANDSCAPE MANAGEMENT, 7500 Old Oak Boulevard, Cleveland, OH 44130. Please allow 2-3 months for an answer to appear in the magazine.

ANNOUNCING

LDW

A BREAKTHROUGH IN COMPACT, LIQUID COOLED DIESEL TECHNOLOGY FROM LOMBARDINI

LDW signals a new lineup of engines from Lombardini and a new era in liquid cooled diesel technology. LDW includes both the full overhead control system (FOCS) and compact, heavy duty (CHD) engines, each of which sets new standards for economical, liquid cooled diesel performance.

Each of these smooth running engines is completely original, beginning with the design, and both offer the ultimate in low vibration, quiet operation and economy.

The FOCS series houses all critical components in the cylinder head to ensure minimum dimensions and easy installation and maintenance.

An indirect fuel injection system uses unit pump injectors rather than the traditional, separate components. This eliminates fuel lines and allows the FOCS to deliver optimum precision of fuel delivery throughout the performance curve.

Overall engine noise is minimized by the use of a heavy duty, toothed belt camshaft drive.

A choice of two, three or four cylinder in line configurations let you match FOCS power to your exact needs.

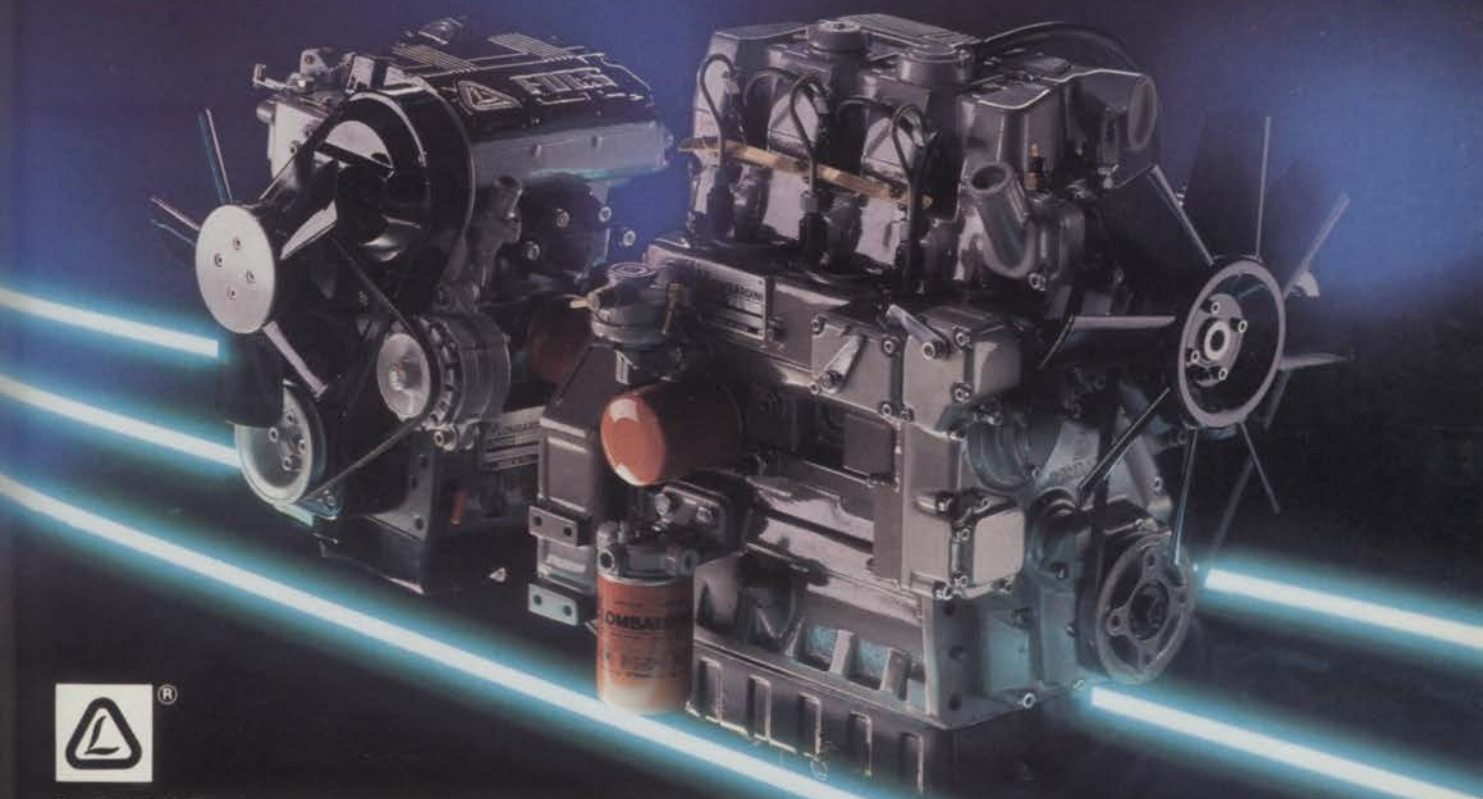
Our CHD also features indirect fuel injection. Using specifically designed individual fuel injection pumps, maximum accuracy of fuel delivery is ensured at all speeds.

Multi-cylinder configuration, reduced unitary displacement and liquid cooling make the CHD ideal for use in applications where operator comfort is of the highest concern.

Power ranges are 12-22 hp for the FOCS and 25-48 hp for the CHD.

Specific fuel consumption is just 0.42 lbs/hp/hr., the lowest of any small, indirect injected diesel. Excellent torque backup of 15% at 60% of maximum rated load means you'll have the power you need, when you need it.

The new liquid cooled lineup from Lombardini: advanced power for your toughest applications.



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THE RYES OF THE TIMES

These are demanding times. Your turf has to look better than ever, but maintenance costs are rising and the pressure's on to respect the environment.

Lofts has four ryes that can meet today's tough demands. Each has its own unique advantages:

- **Repell** contains endophytes that repel above-ground feeding insects naturally. It needs no chemical control for insects like sod webworms, cutworms, chinch bugs, aphids or billbugs.
- **Palmer** and **Prelude** feature heat and drought tolerance and excellent dark green color.
- **Yorktown II** is exceptionally cold tolerant for northern areas, yet it also tolerates hot, humid summers.

From each of the four rye varieties you'll also get many additional benefits, including fine-leafed dense growth, excellent mowability and above-average disease resistance.

Repell, Yorktown II, Palmer and Prelude — alone or together they meet the needs of these demanding times. Good looks with less maintenance for minimum environmental impact.

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